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ABSTRACT

The Organization for Economic Cooperation and Development (OECD) studied scientific and technical information (STI) policy in Ireland preliminary to proposing a coordinated nationwide policy. Following a brief analysis of the general demographic and economic situation in Ireland, the OECD examiners defined the major STI achievements in the areas of access to documents and information dissemination services. They found that, in the absence of a coordinated national policy, individual industrial firms and government agencies set their own policies. A national STI policy was found to be particularly needed for industrial development, science, education, and social development. The responsibilities of the government in establishing the STI policy were developed, and the content of such policies was proposed for the library, information and documentation service, and national government levels. The organization of boards and committees to implement the proposals was also outlined. A meeting between the OECD examiners and Irish officials, set up to discuss the policy proposals, centered around discussions of access to documents; information services to industry; and elements, substance, and institutional arrangements of a national information policy. (LS)

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DOCUMENT

REVIEW OF NATIONAL SCIENTIFIC AND TECHNICAL INFORMATION POLICY

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ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT PARIS 1974

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REVIEW OF NATIONAL SCIENTIFIC AND TECHNICAL INFORMATION POLICY

IRELAND

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

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FOREWORD

The review of scientific and technical information policy (STI policy) in Ireland is the second study of this type undertaken by the OECD Information Policy Group. The object of these studies is to define, in relation to the structures and needs of the countries under review, by what bodies and through what mechanisms the national STI policy is established, implemented, and administered, what is its content, and how it is articulated with other national policies, such as science, education, industry, and economic and social development.

These reviews have a threefold objective. The first is to assist the country under review to take stock of the action it has already undertaken. In the case of Ireland, an analysis of information activities has been the subject of a study made under the aegis of the National Science Council, Scientific and Technical Information in Ireland: A Review, which is the background document for this examination. The second objective is to enable other Member countries to share experience and to improve their own understanding of the role an information policy must play and the mechanisms needed for it to succeed. The third objective is to enable a more precise definition of the field in which international co-operation is most worthwhile.

The examination of STI policy in Ireland has taken a new form. At the request of the Irish government, which is conscious of the increasing need to link more closely national science policy, national STI policy and social and economic development, examinations of STI and science policies proceeded concurrently. This present report does not cover the problems of science policy, which have been the subject of a separate examination and report. However, because of the procedures adopted, the two reports are complementary.

The Irish Authorities are well aware of the need to develop information activities, not only to respond to the normal growth of their requirements, but also to enable the country to face up to competition resulting from its entry into the Common Market.

Given the activities already underway, where do the priorities lie? What activities should be developed first? What should be the substance of a national STI policy and what machinery does this policy need for its implementation? It is to these questions that the Examiners try to respond in this report.

The Examiners were:

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Special thanks are also due to the Directors and senior officials of research institutes, particularly of AFF, IIRS, and AFT, to representatives of the universities, and to all those who have helped in the work and devoted their time so generously to the Examiners and the OECD Secretariat.

Part I

EXAMINERS' REPORT

INTRODUCTION

> "Few countries of the world, if any, can be said to have a coherent, comprehensive information policy covering all related types of scientific, technological, economic and sociological information. Certainly no OECD country has such a policy, although several are undoubtedly groping their way towards one now ..." (1)*

Ireland must no doubt be included among them. As a first step, in spite of considerable difficulties, it has set up bodies which have done worthwhile work in the field of scientific and technical information (STI).

There was an early appreciation of the importance of a close liaison between science policy and information policy, and this has been recently demonstrated by the proposal for the two policies to be reviewed together by the OECD.

Ireland was one of the first countries in the world to initiate general statistical studies of information activities. As long ago as 1963 the Irish Government made a complete survey of science and information activities which served as a basis for the report Science and Irish Economic Development (2). In 1970, the National Science Council supported a new general survey of the resources allocated to scientific and technical information. This survey, carried out efficiently by the Institute for Industrial Research and Standards (IIRS), made it possible to compile the essential data for the preparation of Scientific Technical Information in Ireland: a Review (3).

This present report has been prepared on the basis of material collated by a Working Group specially set up for this purpose by the National Science Council. **

All the bodies concerned with STI activities have been led to define their precise responsibilities in these activities and the resources they allocate to them, and have been able to compare their thinking, means of action and development plans. This first overall survey should enable a big step to be taken towards obtaining a better knowledge of the existing information services and their problems.

The Examiners have based their review of Irish scientific and technical information policy on the information and data given in the Review (3) and on the talks which they had during their visit at the end of June 1972 with government authorities responsible for science and STI policies, those responsible for information activities and representative producers and users of STI. They were impressed by

* The figures in parentheses refer to the bibliography in Annex II.

** The composition of this Working Group is given on page 6 of the Review (3).

the interest most of those whom they met took in STI activities, and by their hopes for a rapid development of the Irish economy. This does not mean that all those they spoke to shared the same view about the role of STI in this development or about the distribution of responsibilities between the public authorities and information services in the conception and execution of an STI policy. Far from it. They encountered very different opinions, which have given rise to proposals for a wide range of activities.

During their short visit the Examiners were unable to examine all information services in detail. They therefore express no view on how these services are managed, and in any case this is a matter for the Irish authorities. The criticisms they do make are put forward in a constructive spirit in an attempt to identify gaps or imbalances in information activities which might hamper the country's economic development. Finally, their suggestions do not claim to provide a final solution to all the problems; they are rather in the nature of guidelines, and of a first sketch of the measures which should be taken to ensure that STI activities make a more effective contribution to the country's social and economic background. In any event they should be worked out in depth and adapted to the Irish context.

Chapter I

THE IRISH CONTEXT

The object of this chapter is briefly to recall certain characteristics of the Irish economy which exert a major influence on national policies and thereby on STI policy.

Ireland is sparsely populated; in 1971 it had a population of 2,978,000 or a density of 42 per square kilometre, one of the lowest in Europe. While large-scale emigration occurred in the 19th and the early 20th century it has fallen off considerably in the last twenty years and external factors such as the recent increase in unemployment in the United Kingdom have certainly speeded up this decline. Between 1966 and 1971 emigration fell to an average of about 11,000 a year and is now offset by the natural increase of births over deaths. In the last ten years there has even been a slight, though steady, growth in population.

The main consequence of this emigration has been to deprive the country of part of its most productive elements. The percentage of population in the 25-64 age groups in Ireland is the lowest among the OECD countries. In addition among those who have emigrated there are probably many potential entrepreneurs and certainly a high percentage of people with professional and other training. The statistics on education and level of training confirm this point, and show that Ireland trains more graduates than it uses.

Another characteristic of the Irish economy is the volume of unemployment and under-employment. As in many countries, under-employment mainly manifests itself in agriculture. Ireland is a country of small holdings (24 per cent of farms are between one and six hectares, 24 per cent between six and twenty hectares and only eleven per cent over 40 hectares). Some of these small farms can barely provide an occupation and a living for all those who live on them. Every year some 6,000 people leave agriculture and most of them seek jobs in industry (cf. Table 1) which helps to keep unemployment at a high level. Its average rate during the 1960's fluctuated around 5 per cent, reaching 6 per cent of the labour force, or 68,000 people in 1970-71. This certainly reflects one of the weaknesses of the Irish economic situation but it is accentuated by external factors such as the rise of unemployment in the United Kingdom, the country which absorbs the major part of the surplus Irish manpower.

Nevertheless, considerable groundwork for the future has been laid by the progress made in the 1960's stemming mainly from State intervention and effort, and Ireland is now passing through a transitional stage between an essentially agriculture-based economy and a mixed industrial and agricultural economy. Industry is now contributing more than agriculture to the GNP and its contribution is growing

Table 1. EVOLUTION OF THE LABOR FORCE

In thousands

	1967	1968	1969	1970	1971
Agriculture	322	313	303	291	282
Industry	297	305	317	317	328
Services	444	449	453	458	461
Out of work	57	61	58	68	68
Total labour force	1,120	1,128	1,131	1,134	1,139

In percentages

	1967	1968	1969	1970	1971
Agriculture	28.8	27.8	26.8	25.7	24.7
Industry	26.5	27.0	28.0	28.0	28.7
Services	39.6	39.8	40.1	40.3	40.5
Out of work	5.1	5.4	5.1	6.0	6.0
Total labour force	(100)	(100)	(100)	(100)	(100)

SOURCE: Review of 1971 and Outlook for 1972 (4)

faster. Similarly, exports of manufactures now exceed exports of agricultural products (although the agricultural content of much of the former must be recognized).

A great deal nevertheless remains to be done to develop the industrial sector and put industry in a position to compete effectively with foreign industries both on home and foreign markets. Industrialization is relatively recent and Ireland does not yet possess industrial establishments of international dimensions. The number of transportable goods and service industries is estimated at about 4,500; about 4,000 of them (88 per cent) employ fewer than 100 people and 3,500 (77 per cent) fewer than 10 people. The fifty biggest industrial enterprises employ a total of 59,300 people or 18 per cent of the total industrial labour force. Without going into detail it can be said that the major problems found in many sectors of industry are problems of innovation, improved productivity and quality, diversification and rationalization, concentration and management.

The objectives

From this rapid analysis, a certain number of priority objectives can be inferred for national policies which should have an influence on a national STI policy.

The first objective is to encourage the creation of new jobs to check emigration, to encourage the return of expatriate Irishmen, fight unemployment and absorb surplus agricultural manpower, and to eliminate such disparities in living standards as still exist vis-à-vis other EEC member states.

Only the rapid development of existing industries and the creation of new enterprises can make it possible to attain this objective (see objectives 3 and 4 below). This development will automatically entail the development of services and will encourage the creation of new jobs in this sector also.

The second objective is to ensure the continued progress of agricultural production so as to make the most of this resource, to improve the condition of those who are engaged in this activity and to check the decline of agricultural employment.

The third objective is to improve the use of natural resources by encouraging the development of industries for the processing of mineral products (lead, zinc, barytes, etc.), agricultural products, marine products and so on.

The fourth objective is to encourage evolution in industries, in order to make them more competitive. Especially in view of Ireland's entry into the European Community, it is of paramount importance that Irish industries should be in a position to compete effectively with foreign industries both on the Irish market and on international markets. This evolution can result only from a series of policies in which STI plays a very important part; policies aiming at:

- promoting a spirit of progress and innovation;
- providing industries with technical and financial aid to modernize, reorganize, improve management and production, increase productivity, and, where appropriate, diversify and regroup;
- facilitating access by enterprises to foreign markets;
- encouraging the education of all levels of personnel in enterprises.

The above objectives are not new and the list is far from exhaustive. They have been the subject of studies of Irish economic, education, science or manpower policy. The government has set up several bodies to carry out the policies necessary to attain them. If the Examiners have emphasized these objectives here, it is for two reasons: firstly, to indicate the weight they attach to the promotion of industry in the Irish context; and secondly, to show that many national policy objectives have a bearing on STI activities.

Chapter II

MAIN ACHIEVEMENTS IN THE FIELD OF SCIENTIFIC AND TECHNICAL INFORMATION

The basic characteristic of information activities in Ireland is that they are the responsibility of organisations which have been set up to respond to the specific needs of research or education. As in most other countries, these activities have so far developed without any plan to seek to interconnect them nationally. The Review which describes all these activities in detail (see particularly Chapters 5 and 6) is the first general study of its kind undertaken in Ireland (3).

The purpose of this chapter is to show the strong points of the present system and to underline the weaker points which could hamper the good functioning and development of these activities. Contrary to certain opinions in Ireland, we believe that these activities are strictly interdependent and that the success or otherwise of some services will help or hinder the development of others.

I. ACCESS TO DOCUMENTS

The Examiners subscribe to the analysis made in the Review, which may be summarized as follows:

Holdings of scientific and technical literature in Ireland are small: in all perhaps a million books and 8,000 journals, which means perhaps half these numbers of different titles.

There is no single large collection of scientific or technical literature; this literature is shared by a score of libraries, mostly in universities, and STI forms a minor part of their holdings. Lack of resources means that those libraries have to restrict their services to "in-house" users. Few libraries use microfiche and to our knowledge none has the necessary equipment for reproducing them directly.

Inter-library loans of books and periodicals (the latter mainly as photocopies of articles) is carried out to a large extent through direct contact between libraries. The formal inter-library mechanism is the Irish Central Library for Students which acts as a clearinghouse for inter-library loans, particularly where this affects the public library system.

Most libraries are found in the Dublin region, which makes access to the holdings difficult for users in the rest of Ireland. Furthermore, because of the absence

of full catalogues and indexes, it is difficult for the user to locate the document he requires. A new Union List of Periodicals has been published by the Irish Association for Documentation and Information Services. This should facilitate the location of periodicals if, as we hope, it is regularly updated.

Entry to most libraries, because of the lack of accommodation and staff, is reserved to a privileged few. An important exception is Trinity College Library which is also one of the few which provides bibliographic and loan services to those outside its own community. It also provides extensive information services, which are used by a variety of organisations including other Irish libraries.

The Review concluded that it was necessary to:

- increase library holdings so that the country could satisfy its most urgent recurrent needs;
- establish holding and acquisition policies (for which preliminary studies have begun);
- subsidize libraries so that they can satisfy outside requests and take part in the preparation of union catalogues;
- co-ordinate policies at the national level so that a system can be set up to satisfy the demands of all users on the following basis:
  - locally: a one-day service within the area of a given library or document centre;
  - nationally: a two-to-three day service operated by a postal inter-library loan system;
  - internationally: a one-to-two week service for all other literature.

II. SERVICES FOR INFORMATION DISSEMINATION

The Agricultural Advisory Service

This highly successful service is by far the most important of the information services in Ireland. The survey of the resources devoted to STI showed a budget of £1,823,000 and staff equivalent to 643 persons full-time, i. e. 55 per cent of all resources and almost 63 per cent of the staff concerned with information activities. Few countries have devoted so many resources to this field.

"Its basic objectives are to help farmers, their wives and families to make the best possible use of their resources by the adoption of new methods and the improvement of existing ones in order to increase their output and income and thus enhance their living standards" (5).

Service is provided free to users. The bulk of its finances come from central Government sources, the rest from rates. It is managed nationally by the Department and locally by the County Committees of Agriculture. The service is also provided at these two levels:

- At the local level, there are 553 instructors - in agriculture, in horticulture, farm- and home-management and poultry keeping. These are directed at

county level by 27 chief agricultural officers (CAO) and 28 deputy CAO's. They visit the farmers to give direct advice and also to organise group meetings, practical demonstrations, winter courses, classes and lectures, field and livestock experiments.

- At the national level, the Department employs 22 full-time subject matter specialists. Their role is to provide liaison between the instructors and all sources of information including research. They also alert the Department's research services and the Agricultural Institute (AFT) on problems necessitating their attention. They analyse information and disseminate it to instructors and to the CAO; they help them prepare their plans for disseminating information among farmers; they take part also in the training seminars for the instructors or the farmers, sometimes in collaboration with AFT.

Additionally, the Department of Agriculture and Fisheries distributes information directly to the County Committees of Agriculture, veterinarians, farmers, fishermen, firms engaged in the agricultural processing and servicing industries, and the general public. All means of oral, visual, or written communication are used, according to the needs of the users.

The Examiners have been informed that the functioning of this service was the subject of a government study, and that this study covered such questions as the orientation of the service, it size, and its management needs. From the standpoint of a national information policy, there are two problems:

- The first relates to a possible diminution of the activities of this service because of their high cost; this would free resources which could be used in other sectors of the economy. The Examiners believe that because of the entry of Ireland into the European Communities, it would be inopportune in the coming five years to limit this service. However, they believe that by internal streamlining it might be possible to offer the same service at less cost.

- The second problem is that of the possible attachment of the Agricultural Advisory Service to AFT in the interests of greater efficiency. Here too the Examiners share the views of their colleagues on the science policy review, and believe that if no decision has yet been taken, it would be better to leave the present distribution of responsibilities between AFT and the Department of Agriculture and Fisheries unchanged.

The Agricultural Institute

An Foras Talúntais (AFT) - the Agricultural Institute - was set up in 1958 and has become the largest research institute in Ireland. It employs 220 research workers and 360 technicians in 7 major centres and 22 field stations or laboratories. In 1971-1972, it received from the Irish Government a grant in aid of £2.53 million.

The functions of the Institute are to "review, facilitate, encourage, assist, co-ordinate, promote and undertake agricultural research."

Specific functions relevant to information activity are set out in the Act (Section 4(2) in the following terms: "... The Institute may do all or any of the following:

1. provide and organise seminars, conferences, lectures and demonstrations on agricultural research and related subjects and on specific problem and programmes in relation thereto;

2. disseminate, or procure the dissemination of, the results of agricultural research to interested persons, including in particular, persons engaged in providing advisory services in relation to agriculture;

3. publish, or procure the publication of, the results of agricultural research."

AFT is free to undertake (or not to undertake) information activities and to devote to these activities whatever part of its budget it considers adequate. However, as we shall see later, the Board of AFT sees these activities as highly important. To carry them out, the Institute has a full-time professional information staff of 18. In 1970, it devoted 3% of its research budget, about £ 70,000 to traditional information activities: information services, liaison advisory service, library, publications, and meetings. But besides this relatively small sum, the research staff of the AFT spend some 31% of their working time in the dissemination of information in the mass media or in answering enquiries free of charge. This represents another 57 man years per annum.

AFT is above all an organisation for applied research. Its personnel, besides the research work they do, are required to interpret, test and adapt to Irish conditions, discovereries made in the rest of the world. AFT emphasizes personal contact between its research workers and the users of its research, and also with scientists working in similar fields in Ireland or abroad. The Institute has implemented a series of measures to promote these direct contacts, particularly with potential users:

"The users of scientific and technical information to whom the Institute's measures are directed include policy makers, research workers, advisory officers, educationalists, producers, processors, marketing organisations, commercial and industrial concerns and the general public." STI services provided by AFT comprise: liaison mechanisms, publications, conferences and seminars, open days and field days, the media, and scientific consultancy and diagnostic services (6).

As can be seen, AFT offers to a wide public a large range of services. While some of these are not directly aimed at STI dissemination in the strict sense, they contribute to it. The general philosophy of the Institute can be summarized under four points:

- to make known its activities in all fields;
- to inform all those who are concerned with its work and to discuss with them their needs in relation to the Institute's programmes;
- to adapt research programmes to the potential needs which the Institute has defined through its contact with users and through its studies on these users;
- to put freely at the service of the Irish community the whole of its work and its services.

The implementation of this philosophy may result in some sectors in a certain duplication of effort with other institutions. But this duplication may perhaps be occasionally necessary, provided it is kept within reasonable limits and is well understood.

We must also underline that economic and marketing studies are undertaken now by the Institute, and several research projects are based on economic considerations. The Examiners believe that in this field AFT is opening a promising line where technological and economic research can be combined in the interests of the users.

We should also point out that the Institute has taken part in several research projects on the needs of users of information and on their information"seeking and using behaviour. It has also been concerned with the evaluation and development of certain manual or computerised information services. Finally, it has helped IADIS to prepare the computerised Union List of Periodicals.

In conclusion, thanks to joint action by the Department of Agriculture and Fisheries, the Agricultural Advisory Service and AFT, we see that there is a complete range of information and advisory services, from pure research through adaptation of information, training of the user, to application of the information by the user. These are major services: there is some duplication, some management economies which might be taken. But in the main, the services are worthwhile and effective: the Examiners believe that this is not the moment to modify them, just when a major development effort is going to be required of Irish agriculture.

The National Institute for Physical Planning

An Foras Forbartha (AFF), the National Institute for Physical Planning and Construction Research was founded in 1964. It is a state-owned limited company operating under a Memorandum and articles of association. It is under the aegis of the Department of Local Government.

The Memorandum defines the objectives for which the Institute was founded as being: to undertake research, to provide training and to advance knowledge of physical planning and development, construction and matters associated with environmental services. The Memorandum defines the function of the Institute, in the field of information, as:

- education;
- dissemination of knowledge and research results;
- maintaining a library;
- provision of advice and information.

There are four divisions - Construction, Roads, Planning and Water Resources. There is also an Education and Information Section. The Institute employs 160 persons of whom 103 are professional and technical staff. It is mainly financed by grants from the Department of Local Government. Each year the Department and the Institute agree on the programme of work and on the budget of the Institute; it is during this detailed examination that specific research and information activities are decided. Its budget, for 1972-1973, is estimated at £ 520, 000.

The Institute has become the main national centre for research in relation to environmental services and plays a vital role in advising central and local bodies in regard to building and construction, roads and traffic, housing and physical (including regional) planning.

It is exceptional to find activities of research and information on almost all problems of physical environment thus concentrated within one institutions. When the Institute was set up, this concentration was unique in the world.

The Institute also offers a good example of vertical concentration in the areas in which it operates, and it assumes all the tasks of:

- the identification of national needs in those areas;
- research, and compilation of data in support of this research;
- dissemination of research results to the user;
- where necessary, the education of the user so that he can gain full profit from this research.

All these activities are interconnected and interact: one cannot say that AFF has one policy for research and another for information: it has a global policy covering all aspects of its activity, which it summarizes as follows:

"Most of the research undertaken at the Institute is applied research; that is, research concerned with solutions to specific problems in defined areas of activity...; it is usually related to a specific function...; and it is undertaken by direct commission and always in consultation with relevant interests, to meet real needs...

"That is research aimed at developing and implementing new and improved technology to meet known needs in relation to a specific function, in a defined sector.

"It follows from this that the effective implementation of this technology is recognized as being of primary importance. Consequently we see our role in scientific and technical information as being, in the main, concerned with technology transfer."

The Institute underlines by this statement that its role does not stop before the new technology, needed by the country, is effectively implemented by the organisations or individuals responsible.

To apply such a policy it is vital to know who can benefit from it. Broadly the Institute sees three groups:

- A primary audience of 5 000 people, including Ministers and senior administrators of Government Departments; senior executives of national and regional semi-state bodies; county managers and chief county engineers and local authorities; professional planners; senior personnel and professional planning and surveying practices; managers and supervisors in large and medium construction firms; teaching staff in universities and colleges of technology.
- A secondary audience of some 15, 000 or 20, 000 persons, exercising similar skills as those in the primary audience and including all architects, engineers, surveyors, managers and supervisors in the construction firms and elected representatives and local authorities.
- A general audience embracing in the main the general public.

The Institute notes that the needs of these different groups vary considerably. Moreover, the way in which this information should be provided and the means of transmitting it vary not only with the user but also with the content of this information.

This is why the Institute, as is appropriate, uses separately or together personal contact, working groups, seminars, training courses, conferences, statistics, manuals, information notes, periodical publications, etc... But the Institute underlines the importance of person to person contact in the transfer of technology, so that research workers and users can explore together the needs and technical possibilities.

This system of transfer is effective. It may not be universally applicable, but it may perhaps be used when as in the case of AFF the number of users is around 5000. In the same way AFF has been able to set up a variety of consultative panels and working groups thanks to which potential users are associated with all stages of the research from drawing up the programmes to the dissemination of its results.

Among the achievements of the Institute it is worth noting that it has prepared for its research workers and its users a series of eleven "basic processing and data systems for essential data relating to the environment."

In conclusion, it is clear that in its field the Institute has a well-balanced and coherent set of activities. The Irish Government has the task of deciding in relation to its available resources and its priority objectives whether these activities should be maintained at the same level, further developed or limited. The Examiners have regretted that in relation to these planning requirements AFF has not produced a more detailed development plan.

Finally the Government also has to set up mechanisms which may help AFF co-ordinate its activities with other services in related fields so as to increase the coverage and effectiveness of all. In 1973 it is not appropriate to see any kind of vertical isolation of information by discipline, by sector or by mission.

The Institute for Industrial Research and Standards (IIRS)

The Institute was set up in 1946 as an independent, government-sponsored organisation and was given a new mandate in 1961. Its main purpose is to encourage the use of science and technology in Irish industry by industrial research and development, advisory and consultancy work, testing and investigation, provision of technical information and standards.

In 1971-1972, IIRS received a grant in aid of £948,000 and its revenue from other sources covered 20% of its expenditure; 25% of its resources are devoted to applied research and development and 75% to a wide variety of technical advisory services. In 1971-1972 it employed 418 persons, of whom 141 were professional and 168 technicians.

It has seven divisions: Building industry, Engineering, Science, Standards, Textiles, Technical information, and Administration. It also has a Techno-economics Department.

Before examining its STI policy, the responsibility of the Technical Information Division, it is well to take a quick look at the objectives of the Institute. The five year plan for 1971-1976 summarizes them in the following way:

"The basic objective of the Institute is to provide the necessary technological support to maintain a growing industrial economy."

The plan goes on to state:

"Technology, its acquisition, assimilation, transfer and use is the raison d'être of IIRS. It is one factor, among many, needed to achieve the desired national objective..."

To attain this objective IIRS plans to :

- develop strongly its applied R and D activities so as to provide viable investment opportunities to firms committed to grow in Ireland and to provide technological support to firms attempting to grow and/or introduce radical change;

- increase considerably the provision of technical advisory services to support the continued efficiency of industry.

As far as its technical advisory activities are concerned, IIRS has developed a large range of services which the plan lists under the following headings:

- specialist technical testing, analysis and measurement;
- cost and production;
- quality improvement;
- problem solving;
- pollution abatement;
- technical information.

Technical information has a growth target of 150% during the five year period 1971-1976. At present, the Technical Information Division has four departments: technical liaison, information analysis, library/information systems, communication. In 1971-1972, it employed 39 persons: 19 professional, 4 technicians, and 16 clerical. Its annual budget was around £ 130,000, about 13% of the total budget of IIRS.

Besides that, it should be noted that the research staff of the Institute spends about 15% of its time in research dissemination activities, representing about 10 man years.

However, in relation to the urgent needs of Institute personnel and Irish industry for STI, this total represents too small a budget and hence insufficient means available to do the job.

Among the various activities and services of the Division it is worth considering three where policy issues are apparent:

Library - IIRS has a collection of 10,000 books and reports and subscribes to 500 periodicals and 60 abstracts publications. This is not enough: for the Institute personnel and for its outside services it has to lean on other Irish and foreign libraries, which introduces delay and considerably reduces the efficiency of its services.

Mechanized information services - In collaboration with the Computer Science Department, Trinity College, Dublin, an SDI service has been set up using INSPEC tapes with 18 clients and successfully applied to IFIS with 15. Also, the Technical Information Division is the contact point for MEDLARS (20 enquirers and 7 searches in a year) and Chemical Abstracts (3 clients). The Technical Information Division plans to develop a multidisciplinary service.

It may be asked whether in the case of Ireland provision of the output of these services directly to the user may not be a little premature. It would perhaps be better to provide the means of verifying the output first, at least by a sampling procedure.

It may also be questioned whether IIRS is the ideal place to locate a MEDLARS service in Ireland.

Finally, it seems to the Examiners that any service which has only a small number of clients and whose number is not growing year by year should be discontinued.

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Technical Liaison Department - In 1972 this department employed a head of department, 2 technical liaison officers (one textile, one food), 1 technologist (packaging), 1 technician (printing/packaging), and 3 clerical workers. Its budget represented 17.4% of the divisional budget. The Examiners believe that this service would be improved by a closer adaptation to the needs of Irish industry: they do not agree with the way in which the functions of this service are described in paragraph 2.4.1 of the Technical Information Division Five Year Plan. It appears that the Division considers the liaison officers as representatives whose prime function is to "sell" the services of IIRS. This impression seems to be confirmed by paragraph 2.4.1. The Examiners believe that the liaison officers should above all be advisers responsible for diagnosing problems and assisting in finding solutions.

However, even using the figure of 4500 manufacturing firms, which is certainly too small, a much larger number of technical liaison officers is vital if firms are to be visited regularly.

More generally, with an eye to the overall policy of this service, the Examiners wonder whether the Technical Information Division is not perhaps tending to develop information services which are too sophisticated for its present potential users. There is a need for them to become "friendlier", which suggest that at this stage there needs to be a human element (the liaison officers) interposed between the services and their users.

On the other hand, we have also noted that in spite of its small budget the Technical Information Division has much to be proud of. It is undoubtedly the best referral centre for industry. Moreover its experience to date will be of immense value once the financial constraints are relaxed.

Chapter III

REMARKS ON THE PRESENT STI POLICY

The situation of scientific and technical information in Ireland is similar to that in many other Member countries: there is no overall national information policy, and hence no unifying concepts on which the operational policies for the various information services can be based.

At present each organisation with information activities sets and implements its own separate policy. Apart from the County Committees of Agriculture, all information services depend on large institutions, e.g. universities, research institutes, government departments, etc., for which information is neither the only nor even the main activity.

Operational organisations enjoy considerable autonomy. Indeed in the STI field several are free to decide what they will do, and what funds they will allocate, within the framework of the overall remit given to them and the budget which they receive from their parent body.

These organisations have generally been set up on a sectoral basis, or to respond to the needs of specific interest groups. Because of this, each has only a partial view of overall national requirements, and concentrates almost entirely on the needs of its own user group. As a result, there is a diversity of view at the national level on the role of information, on the resources it needs and on its methods of implementation. The difficulties that the members of the NSC Working Group on STI faced in reaching agreement on a definition of information which would cover their activities is an indicator of this diversity.

Some organisations believe that their responsibilities in information activities should cover all operations from the production of information to its analysis, its adaptation to the needs of users, and even advice on its application. Some organisations believe, properly, that they have the further role of educating their users in the understanding of new technologies and their application. Others, unfortunately, perhaps for financial reasons, adopt a more passive attitude. Those seeking information are provided with libraries, SDI services and retrospective search services if they take the initiative to come and use them. But in the main there is no active encouragement for these people to make good use of the world's stock of knowledge, which is dispersed in a wide variety of published literature, in know-how from research institutes and associations and similar bodies, in information stores in computerised form, and so on.

As a result, on the national level, some sectors such as agriculture are very well endowed: others, especially small and medium industry, much less well. In addition some information tasks are not yet adequately performed: access to documents and to primary literature for example, which should be available to information specialists and users alike.

The fact that each operational organisation formulates its own policy, besides the inherent inefficiencies of such lack of co-ordination, is often the cause of friction between organisations. This is particularly likely when money is scarce. Each organisation tries to broaden its field of interest and take on more activities in order to obtain a larger share of the available funds, without taking account of the overall national situation. Liaison committees have been set up at the operational level to try to reduce competition and find agreement on the areas of competence of different organisations. These committees have enabled the major organisations to have a general understanding of the major activities of the others. But they have no power to co-ordinate the policies of these organisations of which, it should be remembered, STI is not the prime function.

In the same way, bodies have been set up at the library level to assure certain kinds of co-ordination: the Library Council, Irish Central Library for Students, Irish Association for Documentation and Information Services (IADIS), Library Association, and the Council of National and University Librarians (CONUL) set up in 1972. All these committees and the last three of these bodies have been set up on a voluntary basis, their financial resources are strictly limited, they have serious difficulties in bringing their recommendations to the public authorities, their power of action is limited, and in addition they use up the precious time of a few very busy men.

Industry

The industrial sector merits particular attention. It is built up mainly of small and medium-sized firms; some of these will perhaps disappear but others are destined to become the larger firms of the future. It is vital for both survival and growth that they receive the information which they need in a form which they can assimilate.

Larger firms already have the knowledge and understanding to express their information requirements, and know how to use the technical literature and industrial consultants, research institutes and universities. They are thus able to make effective use of modern information services and turn this information into profit.

Such is not the case for the majority of small and medium-sized firms. Of manufacturing firms employing more than 50 people, 6 out of 7 have no engineers or graduate technologists. They do not know what they need, nor how to ask for it; they cannot derive profit from technical literature, which in most cases anyway they would not have the time to consult. They cannot therefore be linked directly to traditional sources of information, and modern sophisticated information technology has no interest for them. It is essential that they receive information adapted to their individual needs, and to their level of knowledge and understanding, and also the advice they require on how to implement it.

A major effort is certainly needed in training information users: at school, in technical colleges, in universities and in firms. But this is a long-term effort

and there is an immediate need to ensure that the information offered responds to the present real needs of the industrial users.

Government programming and planning

With the exception of the Agricultural Advisory Service which is under the aegis of the Department of Agriculture and Fisheries, Government has no control over or direct action on the activities of information services. This means that there is no way at present for the Government to re-orientate these information services to respond more effectively to the requirements of the socio-economic development of the country. Indeed, apart perhaps from the Department of Agriculture and Fisheries, most Government Departments probably have no means of assessing what their information programmes should consist of in relation to national needs for information and no way of developing a co-ordinated national plan for supplying it.

Information services are mainly funded by four different Departments: Agriculture and Fisheries, Education, Industry and Commerce, and Local Government. At this level, there is no overall plan and indeed no machinery for establishing one. As a result there is an imbalance between the information activities in different sectors (3). Agriculture, at 2.2 million, absorbs 76% of all resources allocated to STI services.

It has been noted also that with the exception of the Agricultural Advisory Service, each operational organisation, university, and research institute is free to give that part of its budget to research or information which seems appropriate. In addition the scientific personnel of the major research institutes devote the following shares of their time to information activities (8):

- 31% of the time of 188 research workers in AFT (The Agricultural Institute),
- 15% of the time of 68% of research workers in IIRS (Institute for Industrial Research and Standards),
- 28% of the time of 20 research workers at AFE (The National Institute for Physical Planning).

This consideration further weights the information effort in favor of agriculture.

The Examiners have no means of deciding whether the overall level of resources devoted to agricultural STI is fully justified; it does appear that the other activities of the country are relatively lacking in information resources. An apparent disequilibrium of this magnitude could be most serious if it did not correspond to the real development needs of the country.

Chapter IV

NEED FOR A NATIONAL INFORMATION POLICY

In Ireland, more perhaps than in other countries which have greater resources and where problems of development and economic growth may be less acute, a national information policy should be the essential complement of other national policies. This is the case for instance, in agriculture where, for many years national policy has been actively supplemented by an appropriate STI policy. Of special importance here are the policies for industrial development, science, education and social development.

Industrial Development Policy

We saw in Chapter I that the economic development of Ireland requires a strong policy for industrial development. This development works mainly through the creation within the individual firms of a willingness to modernize and go forward. An industrial development policy will be fruitless if it is not supported and complemented by an incisive information policy, which aims at establishing a climate of modernization and progress, and at serving the needs of newly-formed enterprises.

The goal of this information policy will be to ensure that services exist which, out of the flood of available knowledge, can identify the improvements in production or management which can be applied to Irish industry. Such knowledge exists; it is widely known, has been published and all the details are available. But the potential users in Ireland may be unaware of its existence or of how to apply it effectively. We are concerned here more with a transfer and application of knowledge rather than a simple transfer of documentation, and hence we see the need for an advisory service rather than just a straightforward liaison with formal documentation sources.

Such an information policy would be incomplete if in addition to information on science and technology it did not also include information on financing possibilities, on legislation, on safety, on national and international markets, and so on.

Policies of this kind are currently applied in developing countries as well as in industrialized countries such as Canada, Denmark, the USA, and the Netherlands. Supporting industrial development through strong information services has probably been a determining factor in the rapid growth of the Japanese economy. A policy

of this kind has been applied with success in Irish agriculture, setting an example from which Irish industry could surely equally benefit.

Science Policy

The relations between science policy and information policy are too well known to dwell on. Clearly, science policy is incomplete if there is not an information policy which promotes a rapid transfer of network R and D results to research workers and other potential users, and so contributes to innovation. Also, science policy will be ineffective if it does not take account of the needs of the country, and the feedback from information activities is required to help identify these needs. Moreover, science and information policies will only tackle a part of the national problems if they do not include research in the social sciences as well as in the natural sciences.

Educational Policy

There are three points of contact between educational policy and information policy. The first is that like research workers, members of the teaching profession are users of STI, and such information must be available to them. But is is rare to find that teaching and research establishments anticipate expenditures on information when setting up a new faculty or a new chair or initiating new research projects. At the national level, educational policy should consider what action may be required here.

The second point is that teachers are training new generations of information users and all their courses should include training in the use of information which will be an increasingly important aspect of their future careers in all fields. In the same way, forward-looking professional training is needed for the information specialists, and courses should be evolving and adapting to this end.

The third point is that teachers in third level educational institutions should act as advisers in agriculture, industry and in the services, including the public sector. An information policy should seek to strengthen the links between the teaching profession and those it serves.

Social Development Policy

This policy is also based on and transmitted through a wide variety of information activities and its effect will be considerably diminished if it is not supported by an active information policy. Such a policy should address decision makers in government, the many public and private bodies concerned, and even the public at large, dealing with questions such as environment, health, social security, economics and all those sectors affecting the "quality of life", as has been well demonstrated by the National Institute for Physical Planning and Construction Research (AFF) in its own field.

In such fields, information policy should have two complementary objectives: to bring information to decision makers in government or the service sectors; and to inform those, including the public, who will be affected by these decisions. It should be noted that government will have a leading role to play here in making available information collected by its Departments (cf. the "Weinberg Report").

Last but not least, all information services reinforce each other's action; collaboration among them is the only way to ensure that all are more effective.

Government Responsibilities in Formulating STI Policy

The formulation of such policies is the responsibility of the Government. It implies decisions and the choice of options in the field of a national STI policy. These decisions may in turn influence and react on the national policy.

As we shall see in the following chapter, there is much to be done in the information field. Everything cannot be done at the same time and in formulating a national STI policy, the Government must establish clearly:

- orders of priority;
- what has to be done, by whom and with what means;
- an overall plan taking account of the objectives to be attained and of a harmonious and co-ordinated development of these activities.

This plan should be based on:

- studies of specific needs of users of information. It must be admitted that the results of most earlier studies undertaken in many countries on user need groups have been rather disappointing. However, useful data can be brought together during the periodic surveys of the resources allocated to information, or through studies of the reactions of users to specific information services, or through more theoretical studies of the level of knowledge of certain user groups and their information-seeking behaviour;
- the development of objectives in different sectors;
- the costs and performance in relation to identified needs of existing services and of systems still to be established;
- existing resources (information services, manpower, finance).

Only Government is capable of organising these activities and creating a climate of co-operation between the various institutes responsible for information activities. It has to:

- take note of and discuss the intentions and requirements of different services (as input to planning and decision making);
- communicate to the services the options it has chosen;
- act as an arbiter;
- provide the necessary means for determining the needs for information in Ireland and for adapting information systems to these needs;
- stimulate the integration of Irish information systems with foreign national systems or international systems;
- organise liaison with governmental or non-governmental bodies, whose activities are bound up with information and information policy, including all those bodies which provide some kind of training facility (management, vocational, information specialist, user training, etc.);
- organise, co-ordinate and support R and D, studies and experiments.

Chapter V

THE SUBSTANCE OF AN IRISH INFORMATION POLICY

The aim of this chapter is to define the main measures which Irish national information policy should cover at the library, the information service, and the national level. Such measures are designed to promote and co-ordinate information activities so that Ireland can cope with the growing volume of available knowledge and put it effectively into the hands of the users, whose needs are only partially satisfied at present. However, both user numbers and needs will grow, partly because of economic progress and partly because as new information services become established new demands are created. In what follows, new activities are considered along with those already underway or being planned, so that urgent priorities can be brought out clearly.

AT THE LIBRARY LEVEL

An efficient information service is of no help to its users if they cannot subsequently have easy and rapid access to the documentation to which their attention has been drawn. Ireland does not and cannot stock all the books and all the periodicals necessary; it is therefore vital that all available resources are used effectively. The following measures should be considered:

- the organisation of a national library network, including perhaps regional sub-networks. The first steps towards such a network have already been taken: it is urgent that they be strengthened and extended;
- the reorganisation of certain libraries in order to bring them up to an acceptable international standard;
- the formulation of an acquisition policy based on identification of the fields in which Irish collections are insufficient, and probably on a greater specialization of libraries in particular fields;
- the improvement of inter-communication between libraries, both at home and with libraries abroad;
- more widesprend use of modern technology, such as microformat;
- the establishment of a central repository where libraries may stock books and periodicals which are rarely consulted.

Setting up a library network means that standards have to be established and applied. It will be necessary therefore to:

- prepare and adopt a common cataloguing method compatible with those used abroad;
- help less well-endowed libraries to reform their indexes and catalogues within the framework of the developing network;
- establish and keep up to date national union lists (of books and periodicals), compatible, if possible, with those abroad, using the most modern technology.

Certain minor improvements would accelerate the circulation and exchange of documents inside the network; such improvements would include:

- a general dissemination of union lists;
- standardizing and accelerating inter-library loans; (through standard processed forms, special covers for book circulation, regional shuttle services, etc.);
- expansion of telex services;
- expansion of reprographic services, especially for microformat.

At this stage, it will also be necessary to consider methods which will improve the user's access to documentation:

- certain libraries, particularly specialized and university libraries, should agree to serve a wider clientele, and in order to do this efficiently they should be subsidized so that they may increase their collections, enlarge their premises, develop their services, etc.;
- in the same way public and technical libraries, across the country are available to everybody and should become privileged access points to documentation networks; this means that they will need staff and sufficient means so that they can perform minor documentation tasks.

Setting up this network could not be effective unless there were a managing and co-ordinating body, preferably with the larger users represented on its:

- this body should interpret the needs of the network to the Government;
- it should also ensure liaison between the library network and the information services;
- it should act as a general referral service;
- finally, it should be the liaison body with foreign organisations and services in the library field.

AT THE LEVEL OF INFORMATION AND DOCUMENTATION SERVICES

Agriculture enjoys a complete range of information services, thanks to the combined action of the Department of Agriculture and Fisheries, the County Committees of Agriculture and AFT. This range should respond fully to the needs of different users in this field: policy makers, research workers, advisers, and agriculturalists.

But the Examiners must point out that over 700 people, full or part-time, are engaged in these agricultural information activities, which cost the taxpayer at least £2.2 million annually. The usefulness of these services is not in question,

but might not a different structuring enable an equally good or even better service to to obtained at less cost?

The picture is different in other sectors of the economy, particularly in industry where the information services are of more recent origin and many are not yet fully developed. This is partly because of the recent industrialization of the country, partly because needs for modernization and efficiency only became apparent when Irish firms were no longer protected by customs barriers, partly also because industry relied on foreign information services, and partly because for a time Ireland hoped to achieve more by bringing in foreign firms than by developing its own national industry. The effect has been that much remains to be done in this sector.

A. Advisory Service for Industry

It seems that state-sponsored advisory services for manufacturing industries need to be developed urgently and on a large scale. While these services should be aimed firstly at small and medium-sized industry it is clear that larger firms could equally benefit from them.

Their first task must be to convince industrialists and managerial staff that new techniques exist, that new methods of manufacture and management have evolved, and that industry can profit from applying these techniques. It is only when these services have established a climate of progress, in which firms are ready to innovate, that they can fulfill their second role as liaisons bodies with the various information services.

This advisory service should develop rapidly. In 1970 the IIRS employed three liaison officers. This number should be increased to around 15 to 20 "advisers" (or "instructors" as they are called in the agricultural service). In support of this proposal it should be noted that in 1969 the Canadian Technical Information Service employed around 30 engineers as "liaison officers"; the Danish service currently employs 12 engineers.

The mission of the advisory officers can be summarized as follows:

- to make industrial managers aware of their needs for information and for further training and updating of their staff in technical matters, and to help them in defining these needs;
- to provide the information these managers need, or to show them how and where to obtain it;
- to help apply this information, especially in smaller firms;
- to identify within these firms, and to help in training, personnel able to receive technical information and transfer it to those who can apply it within the firm;
- to advise on the needs for research, experimental development and application in industry;
- to maintain a register of industrial firms.

Particular care must be taken in selecting these "advisory officers". These engineers should have a broad educational background and wide practical experience in production and management. They should also receive additional training in the

information field. A new effort should be made for training these officers for the industrial sector, similar to the great efforts which have already been made for agriculture.

This service will require not only a team of engineers but also sufficient supporting staff (management, secretariat, library and a strong information and documentation back-up service). This is why it does not seem appropriate to decentralize it, since this would use the special skills of the engineers less effectively and also require a duplication of support services.

As the main purpose of this service will be to promote all sources of information, not only on science and technology but also on management, finance, and professional training, etc., it is vital that the advisory service for industry be established by the Institute for Industrial Research and Standards (IIRS) in co-operation with the Industrial Development Authority (IDA), the Irish Management Institute (IMI), AnCO (the Industrial Training Authority), and Córas Trachtála (Export Promotion Board) and also with other research institutes, universities and other information services.

These advisory services for industry will not compete with those of management consultants. In the first place they will be aimed at firms which generally do not have the resources to employ management consultants. In the second place, their contribution to clients can only be over a short period, one or two days at most. Finally, and when more work is seen to be necessary, they may have to recommend their client to the appropriate source of assistance, including possibly a firm of industrial or management consultants.

B. Improved relations between industry and research bodies (universities and institutes)

As we saw above, the link between small and medium-sized firms and research organisations is normally made through advisory services. However, in the case of relatively large firms or of science-based industries a direct dialogue can be established with research organisations.

The objective is twofold:

- direct transfer of knowledge, while demonstrating to industry the services that these organisations have to offer;

- bringing teaching and research programmes closer into line with industrial needs, whether in technology or in manpower.

Several means are available to do this:

- increasing the number of industrial liaison officers of the type created recently by University College Galway and Trinity College, Dublin (9);

- increasing the provision by institutions of higher education for evening courses, seminars, etc. aimed at servicing industries in their region (including smaller firms). We understand that University College, Galway proposes moving in this direction;

- setting up project committees in which industrial managers can participate with research workers in the planning and management of specific research and development, whose results they will find immediately applicable. AFT, AFF and ESRI have already set up such committees.

C. *Promoting the use of foreign SDI services*

Ireland is too small a market to be able to provide the numerous SDI and current awareness services which it needs. It is vital that major Irish information services test foreign English language services, reach agreement with them and organise their distribution to potential users.

The Examiners differed with the findings of the Review on the exploitation of mechanized SDI or retrospective search services in Ireland. At present there are at most 25 to 30 clients who could use this kind of service with profit. It seems therefore that the best solution would be that major information centres reach agreement with foreign processing services, prepare interest profiles for Irish users in machine language, and ensure that each client reaps the maximum benefit from these services, and that his anonymity is respected.

However, it is vital that the Irish information services have computer terminals connected with appropriate foreign national or international networks and so serve as access points to these networks for all the Irish users.

D. *Pricing policies*

The Institute for Industrial Research and Standards is the only one of the major information centres which requires payment for its retrospective search or SDI services (10). This policy is based on the principle that "access to information will be paid for from state funds while search and delivery costs will be borne by the user". In itself this is a good principle, but the Examiners believe its application at this stage might be premature:*

- such a policy is only conceivable on the basis of a general agreement, and if it is applied by all information services; it should be counterbalanced by subsidies to some users, particularly to those belonging to teaching establishments;

- at the stage when one is still trying to develop and build up the use of advisory services, it is too early to ask for payment from small and medium-sized firms, even if one or two days' work are involved.

E. *Improvement of co-ordination between information services*

More effective co-ordination of efforts, accompanied by a better distribution of tasks between the main services of information would noticeably increase the total effectiveness of these services. For example, all organisations concerned with developing their own information and data files have a part which is relatively general and a part which is highly specific in these files. The more general part tends to be repeated by many information services. Pooling input among Irish information services, and making more effective use of the possibilities offered on the national scale by foreign information services, would result in more effective coverage at lower cost to each service. This can only be done by a sharing of tasks in a well co-ordinated manner.

* This statement does not conflict with the finding of the Review of Irish Science Policy which refers to technical advisory services provided by other departments of IIRS (11). The Information Policy Examiners would suggest that technical advice which can be given on the spot or involving no more that 2 days research should be given free of charge. Other research, development or improvement work should be charged for.

F. Promotion of existing services

At this level, the STI policy should include also the main activities by which the user is informed about the services available to him. Experience proves that even in small countries users do not know about them and the survey on information resources in Ireland seems to confirm this point. This promotional activity includes:

- publicity using mass media;
- publication of guides to national sources of information and to the main foreign sources which complement these;
- seminars for user training;
- courses in technical colleges and universities;
- reporting activities of advisers and liaison officers.

AT THE NATIONAL LEVEL

The whole purpose of a national policy is to allow government to decide, in relation to national needs and resources, what information activities should be considered, developed, and/or subsidized; which are the gaps in the existing system and how to fill them; hence, how to increase the efficiency of existing services, especially through better co-ordination.

A. Data required for information policy

Studies and numerical data are needed for formulating policy, and for monitoring its implementation. Such data are useful not only to government, but also to those concerned with management of information services. Some of these data were collected as one element in preparing the Review, and they will have to be collected again from time to time. They include:

- studies of user needs: the extent of these needs by sectors; the kinds of information; in what form; assessing the growth of these needs, etc.;
- inventory of the existing means of information, including a detailed description of these services, of their personnel and of their equipment;
- data on resources allotted to information;
- data on manpower (qualifications, training, salaries, etc.);
- detailed inventory of various training facilities.

B. STI and central government

The Working Group noted that no Department has a properly equiped internal service of active information dissemination. The authors note that each Department collects a mass of data and non-confidential information which if they were disseminated would be useful not only to other Departments but also to the entire community. And the Review continues, "... this situation does leave gaps in the overall system, gaps in the specialized information in the social and economic fields" (12).

C. *Extension of STI to social sciences*

All decision makers, whether in government, industry, or research have increasing need for economic, financial, social or management information. A major effort is needed here so that the potential users can profit from research and data in these fields. There is also a need for wider understanding of what may become available and how it may be used: non-technical accounts and promotional efforts are needed in appropriate media.

D. *Information research*

A national information policy should cover:

- research into the choice of techniques appropriate to the local situation and their adaptation to Irish needs;
- the training of experts capable of undertaking these tasks;
- the co-ordination and financing of this work.

The Examiners do not think that the Irish government should embark on basic research in this field.

E. *Training*

Acute problems of training and careers exist for information specialists in Ireland, as in many countries. In fact, the number of specialists with formal qualifications in information used in the information services in Ireland is very small (13).

Library training courses exist in Ireland at present. Also, on an initiative of the Department of Agriculture and Fisheries in 1967, courses have been set up for agricultural advisers. However, no training exists for information specialists in engineering, or in any field other than agriculture. It is possible that the numbers of such specialists required at any one time in Ireland does not justify this kind of course. However more numerous scholarships should be made available so that would-be information specialists can be trained abroad.

There is also a need for seminars and re-training courses for those already working.

Career problems exist in Ireland as in other countries: there is an urgent need to reflect on how salaries and general conditions of work can be improved and brought into line with the higher qualifications now being required.

Chapter VI

MECHANISMS FOR THIS POLICY

The reorganisation proposed by the Examiners aims at:

- enabling the Government to set up a policy for STI which takes account of social and economic needs and of the available resources (the term STI is taken here in its widest sense including all information of a scientific, technical, economic, or social nature);

- enabling those responsible for information services to discuss their problems together and to make themselves heard by government;

- improving co-operation between the various services so as to increase efficiency, keep costs as low as possible and enable harmonious development of these services;

- making the best possible use of existing or proposed institutional structures.

The organisation proposed does not try to limit the responsibilities or autonomy of information services or of the major research institutes, but to define the framework within which they can operate and to provide them with the means of growth and development in the national interest.

The proposed systems includes:

i) a government decision-making body: a Committee of the Cabinet on Science and Technology (CCST);

ii) a body concerned with formulating and implementing policy: the National Board for Science and Technology (NBST);

iii) ad hoc or permanent committees set up by the NBST and responsible to it, charged with a co-ordinating function and other specific tasks.

It is interesting to note that the Examiners of both science and STI policies have reached similar conclusions on the structures needed for drawing up these policies.

A. THE COMMITTEE OF THE CABINET ON SCIENCE AND TECHNOLOGY (CCST)

Given the importance of the role of science and technology in government activities, the number of Departments concerned with such activities, and the increasingly large resources which they will absorb, it would seem that Ireland

needs a special cabinet committee responsible for these fields.* The CCST should convene from time to time at ministerial level those Departments which either undertake scientific and technological activities or support such activities.

This committee should discuss all scientific and technological policy problems, including those concerned with information, and their relations with national policies for manpower and employment, for agriculture, for industry, for education, and more generally with policies for socio-economic development. This committee, as part of the Government, might have power of decision on national policies and budgets for science and STI delegated to it to be submitted to Parliament.

In the field of information, and to facilitate the establishment of a national policy, it would be helpful if those organisations currently receiving a single government vote covering both research and information activities receive in future separate support for these two activities.

After Parliament has approved the policies and budgets proposed, each participating Department would allocate the resources approved to the appropriate organisation for action.

The Secretariat of CCST could be provided by the National Board for Science and Technology.

B. THE NATIONAL BOARD FOR SCIENCE AND TECHNOLOGY (NBST)

The Examiners believe that it will be necessary to bring together into a single national body all responsibilities for R and D and information activities, whose aims are complementary.

The NBST would be charged with drawing up the various programmes and budgets and submitting them to the Cabinet Committee, indicating the various options and their implications.

It would be the body to which Government would refer for advice on all scientific and technological policies.

It would undertake those studies considered to be necessary and publish reports where appropriate.

It would monitor the carrying out of programmes decided by Government. However, all bodies providing information services would retain their full responsibility for managing these activities as well as new ones which may emerge from agreed programmes.

The NBST should advise on the preparation of development plans of STI services and co-ordinate them.

It would have a budget sufficient to cover its own expenses and those of its working groups and which would allow it to finance research, studies, pilot projects or experiments in information services. However, the financing of information services would remain the responsibility of the appropriate Government Departments.

* Many Member countries have adopted similar measures for co-ordination and decision at the ministerial level: Canada with its Privy Council Committee on Scientific and Industrial Research, France with her Délégation générale à la recherche, etc.

It should set up and define the terms of reference of working groups, whether ad hoc or permanent, and report on these to the CCST. It should arbitrate in a general way on issues arising between the various information services with which it is concerned.

Among the permanent working groups which should be set up urgently, two deserve particular attention.

The Library Co-ordinating Committee (LCC)

Its objective should be to extend and formalize the existing embryonic library network by bringing together into the framework of one effective organisation all the present scattered activities. All lending and reference libraries whether public or private of significant size, should participate in this network.

The co-ordinating committee should be composed of no more than eight representatives of participating libraries; three representatives of users (from research, teaching, industry); and one representative of the Co-ordinating Committee of Information Services (see below).

The Secretariat and the budget of the committee should be provided by the NBST. The principal tasks of the committee should be to:

- develop and improve the library network;
- establish necessary standards and rules;
- prepare and keep up to date the union lists (compatible with those overseas);
- organise the necessary infrastructures for the network;
- determine an acquisitions policy;
- organise liaisons with appropriate services abroad and establish a national referral centre;
- establish a national repository for holding stocks of books and periodicals;
- submit to the NBST and to the Higher Educational Authority plans for financing the network and for subsidies required so that certain libraries can extend their services in response to user needs;
- put forward recommendations on training librarians and users, and on library career structure.

The Co-ordinating Committee for Information Services (CCIS)

Its objective should be to bring about a genuine co-ordination of services so that each helps the others to build a more efficient system.

The directors of major information services, Department of Agriculture and Fisheries, AFF, AFT, IIRS and senior representatives of major organisations actively concerned with information activities, e.g. IMI, IDA, Córas Tráchtála, should take part in this Committee. There should also be three user representatives and a representative of the Library Co-ordinating Committee.

Like the LCC, the Secretariat and the budget for this Committee should be provided by the NBST. The main task of the Committee should be to:

- co-ordinate the activities of the main services;
- develop common policies each time this is desirable or possible, for example, on pricing of services;
- determine how efforts might be re-grouped or rationalized in the interest of greater effectiveness;
- stimulate the preparation of a development plan for STI services;
- make suggestions for a better dissemination of information concerning social sciences;
- make recommendations on requirements for liaison, particularly with foreign services, and for financing liaison with bodies abroad;
- undertake on behalf of the NBST studies on user needs, resources, etc.;
- make recommendations on training facilities to be set up or supported.

CONCLUSION

The picture of the development of STI activities in Ireland is confused. Some well-managed and generously subsidized information services are flourishing but others, without these advantages, are struggling. There are also a number of services of more recent origin which are not yet making as effective a contribution as might be desired.

But these activities exist: they are the product of organisations which have accumulated experience, expertise and talent. These organisations can develop into the effective national STI system of tomorrow. It has been shown that they do not compete but rather complement each other. Their interaction and inter-dependence mean that the inefficiency of one can hamper the development of others. This is why it is vital to co-ordinate their development. Some attempts in this direction have been made at the operational level either by libraries or by information services; however, lack of financial resources and of power of decision by the heads of these institutions and particularly the problem of being heard by the Government in this field, have made these attempts disappointing.

Furthermore, at present the Government has no means of stimulating this co-ordination and making it more effective. It is vital to set up a mechanism which will allow these organisations to exchange experience, discuss their problems, decide on common actions, and enable a dialogue with the Government. Two committees have been proposed for this purpose: the Library Co-ordinating Committee and the Co-ordinating Committee for Information Services. A close liaison should be ensured between these two and between them and the policy-formulating body: the National Board for Science and Technology, on which these two Committees will depend.

This National Board will be the national focus for Ireland in all questions concerning science and technology. It will have to identify clearly the national needs for information services, formulate national policies for science and for information and present them with alternative options to the Irish Government. The National Board will have to co-ordinate programmes and monitor their implementation. However, organisations providing information services should retain full authority on the management of their activities.

The National Board should have a small budget to cover its own expenses and those of the two committees, and also to enable it to finance studies and pilot experiments in information services. It will be designated by the Government as the responsible agent for such activities. The financing of information and scientific activities should remain the responsibility of the appropriate Government Departments.

At the national level, the Examiners believe that because of the role of science and technology in governmental activities, and because of the number of Departments concerned and the growing resources these activities will absorb, Ireland should have a special cabinet committee dealing with all matters of science and technology. Canada, France and many other countries have set up mechanisms of this type, bringing together ministries with responsibilities in these fields, to which Government can delegate powers of decision on national policies and budgets for science and STI. In deciding on these policies the Cabinet Committee should consider their relation with national policies for manpower and employment, agriculture, industry, education, etc.

The Cabinet Committee in providing Ireland with a real national policy for STI will help it to face up successfully to the challenge of entry into EEC and thence to derive the maximum profit for its social and economic development.

Part II

ACCOUNT OF THE CONFRONTATION MEETING

INTRODUCTION

The Confrontation Meeting was held on 22 March, 1973 in Dublin in the Burlington Hotel, following the 19th meeting of the Information Policy Group. The meeting, chaired by Mr. A. A. Winters (Netherlands) was attended by members of the IPG and a large Irish audience. The questioning was led by two Examiners - Dr. J. de Meulder (Belgium) and Mr. K. Klintøe (Denmark). Ireland was represented by a special delegation led by Mr. M. Murphy and consisting of:

Department of Finance:	Mr. M. Murphy, Assistant Secretary
	Mr. J. F. MacInerney, Deputy Assistant Secretary
	Mr. M. Manahan
Department of Agriculture and Fisheries:	Mr. M. O'Doherty, Assistant Secretary
	Dr. H. Spain, Assistant Secretary
	Dr. M. Reidy, Faculty of Agriculture, UCD
An Foras Taluntais (AFT):	Dr. T. O'Tuama, Chairman
	Dr. T. Walsh, Director
	Mr. M. J. Kilroy, Assistant Director
Department of Industry and Commerce:	Mr. N. MacLiam, Assistant Secretary
Institute for Industrial Research and Standards (IIRS):	Dr. D. T. Long, Chairman
	Mr. M. J. Cranley, Director-General
	Mr. G. P. Sweeney
Department of Local Government:	Mr. E. T. Sheehy Assistant Secretary
An Foras Forbartha (AFF):	Mr. P. O'hUiginn, Managing Director
	Mr. C. Curran
Department of Education:	Mr. T. O'Floinn, Assistant Secretary

Higher Education Authority (HEA):	Dr. T. O'Raifeartaigh, Chairman
	Mr. J. Dukes, Secretary
Library Representatives:	Mr. P. Brown, Trinity College, Dublin
	Miss E. Power, University College, Dublin
Irish Central Library for Students (ICLS):	Mr. T. Armitage
National Library:	Dr. P. Henchy, Director
National Science Council (NSC):	Prof. C. O'hEocha, Chairman
	Prof. C. T. G. Dillon
	Dr. S. Nielsen, Secretary General
	Dr. D. Murphy
Irish Productivity Centre (IPC):	Mr. J. B. Ryan

The discussions hinged around the following topics:

- Access to documents
- Information services for industry
- Other elements of a national information policy
- Substance of a national information policy
- Institutional arrangements for information policy.

The Chairman, opened the meeting by expressing his appreciation for the hospitality and facilities offered by Ireland. He recalled the objectives of the meeting and then introduced Mr. Murphy, the head of the Irish Delegation.

Mr. M. Murphy expressed the regrets of the Minister for Finance who was unavoidably absent, recalled the excellent and friendly relationship between Ireland and OECD, and welcomed the opportunity of hosting both the IPG and confrontation meetings. He admired the Examiners' report, considering it a fair and comprehensive evaluation of the Irish situation, and stressed that the results of the confrontation would be judget by the "positive action we in Ireland will take as a result of the recommendations made in the Examiners' report and of the ideas aired in the course of today's meeting."

The Government which had just left office had already taken a decision in principle to set up a statutory body for science and technology and it was hoped that some advice on this might be found in the Examiners' report and the confrontation meeting. Some questions on STI policy - especially with regard to its political importance and various organisational aspects - would be difficult for the Irish Delegation to answer, given the recent formation of a new Government. However, Mr. Murphy hoped for frank discussion to provide this new Government with an insight into the problems of STI.

Dr. de Meulder gave an explanatory comment on the Examiners' report: it is not intended as a "back-ground report" (i. e. a complete, factual statement of the

Irish situation)*; its recommendations concern general STI policy, not management of STI systems; the report may contain some factual mistakes which could be corrected if they were brought to the attention of the OECD Secretariat. He also pointed out that the suggested recommendations are not expected to be a complete solution to the problems of STI policy in Ireland but are put forward as a guideliness to be worked out in depth and adapted to the Irish situation by the Irish authorities.

* This was prepared on the basis of material collated by a Working Group specially set up for this purpose and published as Scientific and Technical Information in Ireland: A review (3).

First Topic

ACCESS TO DOCUMENTS

This was introduced by Dr. de Meulder. Ireland has limited holdings of scientific and technical literature, and cannot stock all books and periodicals needed. It is vital that all available resources be used effectively. A major requirement is that all libraries be brought into a national network so that books and periodicals can be accessible to potential users in any part of the country quickly and reliably.

"Do the Irish authorities agree that such a network is necessary, and do they feel that it is the most feasible and effective framework on which to build a national information system, or is there a better structure for this matter?"

Mr. Brown noted the need for three levels of approach to "access to documents" - local, national and international, and described how the Irish system worked at these levels. No one library has an extensive STI collection, although all British publications are in Trinity College Library as a result of the British Copyright Act. Publications from other countries are poorly represented and widely scattered. This situation has led to the beginnings of a network. The national and university libraries have begun to co-ordinate acquisitions and services; the Irish Association for Documentation and Information Services (IADIS) has produced the Union List of Periodicals; the Library Council is considering the closer coordination of library services and the future role of ICLS. However, these developments are independent and uncontrolled and should be coordinated.

The proposed network poses problems. Most libraries fulfill particular institutional functions or are privately owned. Sources of finance are correspondingly diverse. Clearly some form of common funding is needed to develop a coordinated network.

There are certain requirements for an effective national STI network; the level of library operations must be raised, involving improved communication between libraries, location lists and indexes. Above all, the machinery for implementing a national STI documentation policy must be set up. Inevitably within such a network the major part of the national services will be provided by the larger libraries.

Mr. Brown also discussed alternatives to a national network:

1. A national STI documentation centre would be simpler but would lead to considerable duplication of holdings. (There is need for a central repository for storing lesser used material).

2. While dependence upon foreign documentation centres is necessary beyond a certain level of literature, experience shows that with present communications this cannot satisfactorily meet regular demands for rapid access to documents.

* * *

Dr. de Meulder observed that one of the first tasks of a network coordinating committee would be to identify weaknesses in existing STI holdings in relation to the most immediate and recurrent needs. He then put the following questions:

"How will these weaknesses be identified and how could a national acquisitions policy be designed to eliminate them at least cost?"

"Would it be beneficial to specialize the distribution of STI literature so that certain libraries would concentrate on developing complete holdings in particular subjects; how could such specialization be brought about?"

Mr. Armitage said that planned coverage of STI documentation with easy and rapid access would be possible when all organisations are part of a co-ordinated network. Weaknesses (and solutions) can only be assessed after such a network has been established. The establishment and maintenance of union lists and records via modern technological means will be essential, as will the development of a co-operative acquisition policy. Such a policy might develop along subject lines: libraries having strong STI holdings in particular subjects would continue to specialize and get support to enlarge their holdings.

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Dr. de Meulder stated the Examiners' belief that a major part of the co-ordinating committee's functions would be to make recommendations to Government for the further development of libraries, so that they might broaden their activities to serve wider national needs. He asked:

"Do the Irish authorities agree that this function should have a priority ranking?"

"Can resources be made available for this purpose?"

"In order to serve wider national needs, what tasks should be improved or developed and what should be the order of priority?"

Mr. Murphy said, in reply to the second part of the question, that resources could certainly be made available if the Government were convinced that the cause was worth of support.

Miss Power suggested the need for a grant-awarding body similar to the National Science Foundation (USA) or the Office for Scientific Information (OSTI) in Britain. She hoped that access to documentation would be given a priority ranking by the Irish Government and their relevant Departments, and referred to the statement in the Examiners' report that the Irish authorities are well aware of

the need to develop information activities". Implementation of the Examiners' report would depend largely on such information being made available in Ireland.

In reply to the last part of the question, Miss Power felt that priority should be given to increasing the appropriate material in the holdings of younger foundations, particularly with regard to recent literature in science and technology, including the social sciences.

Mr. Sweeney suggested that one means of identifying weaknesses might be to study where people are satisfying their documentation needs (e. g. Ireland, Britain, elsewhere). This would show how, even within the existing situation, the various components, which make up the network, could be opened up further, and perhaps more speedily.

Mr. A. Aines (USA) considered the lack of awareness of the importance of information among high level authorities as big a problem as lack of resources. Many things can be done, without major resources, to improve access to the world's knowledge: radio and television, non-bibliographic media, international meetings and exchange visits, etc.

Dr. M. Cremer (Germany) preferred his concept of "access to documents" for the library system of a country, which must serve as a strong backdrop for any development of a technical information system. Networking might not be the best solution to every information problem. From German experience, he suggested that a mixed centralized/decentralized network might suit Ireland.

Dr. R. S. Rettie (Canada) wondered if the general public could look for a technical document in the library of TCD or any other university. He also asked if a charge was made for the use of these resources.

Mr. Brown said that even if the general public could enter university libraries freely, it would be difficult for them to locate the information they wanted. Such access would be in competition with access by the university students and staff. In TCD an Information Officer works full time in servicing requests for loans or for references to books in the library. Access has to be limited somewhat if it is not to be to the disadvantage of the most direct users of these libraries: all the college libraries, however, would wish to have a larger population using the collection.

Miss Power agreed that all university libraries welcomed external requests or enquiries. However, the university community must come first, although efforts were being made to accommodate greater use by the general public.

Dr. Cockx (Belgium) wondered whether Irish collections were sufficient to sustain a fully-fledged information transfer system, and whether university/industrial interaction enabled librarians to become involved in information policy-making at all levels.

Second Topic

INFORMATION SERVICES FOR INDUSTRY

Introducing this topic Mr. Klintóe said: "If Ireland is going to develop further its economy and play a full part in the EEC, Irish manufacturing industry should be developed as described in Chapter 1 of the Report. In our view, STI in its very broad definition, including non-technical, marketing, economic, and other information, should be a major contributing element." He then posed the following question:

"Do the Irish authorities share this view, and what would be the implications for scientific and technical information policy?"

Mr. MacLiam replied that the Irish authorities unreservedly accept the view, that STI, in its broadest definition, must be a major contributing element to the developing of Irish industry. However, when we come down to the implications of this, we find some difficulty. The Irish Productivity Centre is active in this field and other bodies mentioned in the Examiners' Report perform activities which fall under the broad definition of information. He did not agree with the idea of centralizing all these services. He preferred at present to limit policy considerations to information of a strictly technological nature.

On the second part of the question, Mr. MacLiam felt that many of the implications are spelled out in the Examiners' Report and, in his opinion, there would be a strong disposition to accept these recommendations. One implication which emerges very clearly is that STI should be much more closely geared to industrial policy and, perhaps, to other forms of information, but not necessarily combined with them in a single system.

Mr. Ryan, said that the Irish Productivity Centre provides an advisory service to small and medium-sized business in the broad range of areas outlined in the Report. It has 15 advisors, consisting of engineers, accountants, experts in marketing, economists, and people with skills in the personnel area. However, it does not as yet provide the formal links to information services envisaged in the Report. Pooling of IPC resources with those of IIRS or other institutions had been rejected by the IPC Council which felt that the service could be most effectively provided to business under the aegis of the Federated Union of Employers and the Irish Congress of Trade Unions. The IPC co-operates actively in a co-ordinating

group, under the auspices of the Department of Industry and Commerce, with other agencies working in this area.

* * *

The Examiners do not believe that the existing means of STI used by Irish industry, i.e. seminars, confrontations, liaison services, are sufficient. Mr. Klintøe asked:

"Do the Irish Authorities feel that such traditional means of information are adequate?"

"If not, what further action is required to awaken the interest of industry in its information needs?"

"Should a special policy be designed for small and medium-sized firms?"

Mr. MacLiam felt that the traditional means of information have been very valuable, but are not supplying all needs. The level of provision of information needs to be improved, particularly in individual firms. Personal contact with managers and technologists will awaken industries' awareness of its information needs. Demand for information must not only be met, but also stimulated.

Mr. Sweeney felt that the Examiners were raising two questions: the adequacy of the type of service and the level at which they are provided. The various services referred to by the Examiners operate to create a general awareness in an industry or a sector. They must be able to give the user the information he wants, when required, and appropriate to his needs. The efficiency of information transfer, especially for small firms depends on being able to provide the information through personal contact.

An effective and adequate information system should include:

- a liaison advisory service making direct contact with managers and technologists;
- an information analysis service, providing rapid replies to enquiries, comprehensive literature search, repackaging information, and current awareness services;
- a translation service.

A specialized documentation centre with a wide range of information search tools, e.g. abstracting and indexing services, etc. is also needed.

* * *

Mr. Klintøe then introduced the third set of questions:

"Should existing liaison services be expanded and transformed to play a strong advisory role as in Irish agriculture?

What infrastructures and back-up services would be required to support such an expanded liaison/advisory service; how could these be provided?"

Mr. Sweeney said that STI services should stimulate the exploitation of all scientific and technological resources through a liaison advisory service concerned with increasing demand for, and use of, information for innovation. Liaison Officers act as a two-way channel of communication and information transfer with firms, creating an awareness of the opportunities in technology and markets.

The Examiners feel the IIRS is not providing this service adequately. IIRS plans are that up to 1976, 12 more professional staff will be engaged on this work. It is proposed that the liaison advisory service be on a sectoral and regional basis, and that the advisory officers be experts in particular industrial technologies. It also is proposed to set up regional advisory offices from which the officers can operate. This will also permit close contact with local development organisations, universities, regional technical colleges, etc.

* * *

Mr. Klintøe then raised the following question:

"What qualifications do the Irish Authorities see as being needed for the variety of liaison officers anticipated?"

Mr. Sweeney said that liaison advisory officers should be good communicators and have the personal qualities and analytical abilities to operate on their own initiative and find out where the real problems lie. They must be scientists or engineers and must have appropriate industrial experience.

* * *

The next question was also put by Mr. Klintøe:

"What principles do the authorities believe should be followed in charging for the different information services offered to industry?"

Dr. Long referred to the charging of fees for STI services, not only because the Examiners had raised it, but also because some weeks previously the OECD Science Policy Examiners had been critical that the IIRS did not charge sufficient fees for its various services. It has been the policy, both of the Minister and of the Board, that the Institute should maximise its earned income. This was decided upon for several reasons, not the least that payment for a service is an indication that the firm really needs it and will probably put the recommendations into effect. The Board has defined a policy on fees based on the time devoted to the particular task. Earned income has increased (absolutely and relatively) in recent years, and in the financial year 1972-73 will represent 22% of gross revenue expenditure.

The Board was aware that an STI Service should be treated as a special case and had made an exception in that charging of fees for the dissemination of technical information would be at the discretion of the Director of the Technical Information Division.

Mr. Sweeney outlined the IIRS philosophy on charging for technical information. STI has traditionally been free, which is perhaps a reason why it has taken so long for it to be recognized as an input to successful technical processes. Information is expensive both in making it available and in processing it to clients needs. Willingness to make even a token payment indicates a need.

IIRS has decided that access to information should be free, but search and delivery should be paid for by the client. Library documentation, computer tapes, activities directed toward promoting and creating the information, and diagnosis and definition of problems, are funded by the State. Delivery to the specific need is charged for if it takes more than a half day's work.

* * *

Mr. Klintóe said that the Examiners believe that relationships must be established with major international computerised STI services. While they feel that many Irish industries are not in a position to take advantage effectively of direct linkage to such services, research workers in universities, research institutes and big industry need the information resources offered by these services.

He asked:

"Do the Irish Authorities agree?"

"How do they propose creating primary links between these international services and Irish research workers, and how will the researchers be stimulated to use these services? How can intermediary services be designed to adapt the output of computerized information services to the needs and level of understanding of smaller Irish firms?"

Mr. MacLiam said that like countries of comparable size and industrial development, Ireland is almost entirely dependent on advances abroad for the technological advance of its own industry. It has a special need to keep open all channels of communication from abroad. The main means of importing technology has probably been the setting up of foreign firms. Change in taxation arrangements might discourage considerably the further development abroad of branches of foreign concerns.

Ireland must not rely unduly on a few channels through which technological information can flow into the country, particularly those outside our control. Computerised STI services make it possible for the individual researcher to have access at a reasonable cost to large amounts of the world store of information. The Irish authorities would agree on formal relationships with computerised services, if we can afford them.

Mr. Sweeney said that experience with computerised services has shown that it is important that the user be free to formulate his question in his own way. A trained person should then translate his query into the form required for processing and effective retrieval. Direct links between international services and Irish research workers might create some frustration for the user. It would be more efficient if an Irish centre acted as an agency for foreign processing centres and was responsible for marketing and liaison operations. The way in which IIRS acts as agent for CAS and MEDLARS, (both processed at British centres), is an example

of this approach. Where no foreign centre exists for processing a data base containing material relevant to Irish industry, such processing should be done in Ireland using experience already gained in processing INSPEC and ARGUS data bases.

It would be expensive to set up terminals for real time access in various places in Ireland, but the advantages would largely outweigh the cost involved. A demonstration of the RECON system in Dublin had shown that this service stimulated the use of other data bases and other information services. The various systems outlined should develop in parallel.

Lack of funding in universities and (perhaps) research institutes has prevented a wider use of computerised information services, and special funding measures might be desirable to give these research workers access to such services.

In relation to small firms a computer is a tool by which information staff can provide them with information directly or through liaison advisory services.

In answer to a question from Mr. Favre (Switzerland) about consulting firms, Mr. Sweeney said that during the STI Survey they had discovered that some are very intensive users of information and act as a medium between the information source and the client, especially in the building and construction industry. The IIRS had developed close relations with some of these consulting firms and staff of its specialized departments work closely with them.

Mr. Van Dijk (Netherlands) said that the discussion has been focussed on bringing information into industry by outside mechanisms. The problem did not lie there. In any industry there should be a focal point, a central mechanism where awareness of information needs is concentrated. Two-way communication demands perceptiveness within industry. He wondered if this problem was recognized, if anything was being done about it, if there were courses for industrial information offices, or if students in technical colleges were conditioned for information awareness.

Mr. Sweeney replied that the Review (3) shows that few companies have anyone acting as an information focus, distributing it and ensuring its use. This lack of focus is what characterizes a small firm. The Examiners stated that one of the functions of the liaison advisory officers should be to seek out people within firms who could act as a focus, assist in training them, etc. He recognized that the IIRS should be more effective in this area, identifying and creating "gatekeepers" in each firm, and also the need to build into courses in universities and colleges of technology an awareness of the importance of STI.

Mr. A. Aines (USA) said that the State Technical Services Act had been passed to stimulate small business by encouraging the flow of knowledge in industries which did not have an R and D base. It was in some ways a failure, because the need for receptivity among small organisations received too little attention. A study had indicated that the policy was wrong in assuming that providing firms with knowledge was the answer; there are also requirements for improved management and other capabilities necessary to take advantage of the knowledge and use it effectively.

Dr. O'Tuama wondered if the debate was not at too high a level in dealing with problems of the necessary services for industry. Universities, research institutes and large industries are already aware of the importance of technological input. But many Irish industries, and not always the smallest, have no awareness of their STI needs. Top management is often indifferent to the importance of technological

input. This does not mean a refusal to be convinced, but rather that the task awaiting the advisers is very great. No matter how small an industry, the presence of even one technically trained person can be of tremendous benefit, and advisors should do their best to convince industry to employ at least one such person. This will help the industry and will provide the focal point through which STI can be transmitted.

He felt that regarding payment, there should be no charge for this type of exercise, but any subsequent services to industry, by way of technological input or STI, should be paid for. The method of payment should be tied to the successful use of the information or the technology given.

Dr. Walsh said that information analysis should give a concise statement of the essential information position on a subject, not a comprehensive review of published work. AFT used R and D personnel to prepare technical bulletins, and provide in-training courses and seminars. The motivation of people to accept the information depends on the capacity and standing of the individual concerned with providing it.

The AFT approach to computerised STI services has been to prepare interest profiles and to evaluate and test them. Contacts with foreign research associations will be expanded in order to bring to the benefit of Ireland major developments arising in their laboratories.

Mr. Kirouac (Canada) said that the Canadian Technical Information Service found that the best way of making industrialists aware of their STI needs was by means of liaison officers scattered throughout the country. Advisory staff consists of scientists, engineers and technicians, all with good academic background and wide industrial experience. Qualifications are important, but the advisors' attitude is even more important because he has to create confidence and credibility. The approach to a firm consists of describing the services available, then walking through the plant to identify one area needing improvement and trying to pass on the necessary information to improve the situation. Liaison officers then follow up the recommendation.

In small and medium-scale industries, information does not flow, it has to be pushed. Charging may deter many clients thereby defeating the object which is to serve all industry. It may also result in a marked increase of non-productive effort by the service such as selling, administering, collecting, etc. and may lead the service to concentrate on clients producing the greatest financial return. A free service offers great scope to the adviser to concentrate on assignments yielding the biggest impact in terms of productivity and employment. Also the amount of assistance rendered is not hindered by the ability to pay.

Third Topic

OTHER ELEMENTS OF A NATIONAL INFORMATION POLICY

Dr. de Meulder remarked that much of the effort put into the development of information in Ireland had been directed towards agriculture, science and technology in the narrow sense. Information from a variety of social science fields is becoming increasingly important, and he asked:

"What measures are envisaged for improving access to such information for those who require it?"

"And, for example, what measures would enable the information produced by the Economic and Social Research Institute to be more widely disseminated and effectively utilized?"

Mr. Murphy agreed with the Examiners' remark. He found it highly desirable that the social, natural and life sciences should interact with one another increasingly in the formulation of policy for economic and social development. In Ireland the absence of sophisticated mechanisms of information transfer is compensated by the small scale of our activity and by the fact that increasingly there are informal, but very effective, arrangements for consultation and information transfer. However the need for formal mechanisms is becoming greater.

As worded, the questions may seem to underestimate the work of the ESRI, the Medico-Social Research Board, the Irish Productivity Centre, the Irish Management Institute, various university departments and the Science Policy Research Centre at UCD. All are doing excellent work and there is no restriction on publishing the results of their work. All have a high level of contact with related organisations abroad and they are very effective in absorbing and assessing a wide range of aspects of the social science fields.

Besides formal mechanisms there are other arrangements for communicating information, e. g. government departments and semi-state bodies publish comprehensive annual reports which are freely available and fairly widely publicized. However, the demand for them is not great which is a cause for concern.

Parliament is quite a powerful and widespread communication medium. Each Minister makes, every year, a detailed statement of all his Departments' activities,

of what it proposes to do in the year ahead and, very often, over a period of years ahead. These statements and parliamentary debates are duly published. The Government Information Bureau exists to convey information to the public about government activities, but he felt that there was scope for improvement in the general arrangements for the dissemination of information. The greater employment of public relations officers might help.

Mr. Sheehy for An Foras Forbartha said that information relating to the social sciences is needed by decision-makers and by the general public. AFF adopted different procedures depending on who was to receive the information. Some very relevant material was made available immediately, some appeared as research reports, or was used in seminars, conferences, etc. In addition, they had contact with people and groups to make them aware of planning issues, housing, etc. AFF is also linked into the relevant international information systems.

The Report probably does not give enough credit to what is being done here. There are informal, but regular arrangements for consultation between the institutes and other bodies and these will develop as the basic material does. AFF would welcome a more formal relationship if the need for it arose.

Dr. O'Connor described ESRI activities in disseminating information, e.g. all ESRI work of the requisite quality is published and is freely available; seminars open to all are held fortnightly at which staff describe work in progress; every six months a register of social science research projects in Ireland is distributed. The frequency with which ESRI research findings are quoted and used in documents of government departments, business organisations, trade unions, etc., is proof of the effectiveness of dissemination. The Quarterly Economic Commentary and the associated CII/ESRI Joint Industrial Survey is considered to be the most authoritative, independent assessment of the state of the Irish economy.

The impact of the Institute's work would be greatly enhanced if organisations to which its findings were relevant were better geared to exploit them. The ESRI is not a practical problem solving body and does not try to act as such. The value of its research is that it is undertaken by detached and well-informed observers. All research needs development, but this can only be performed satisfactorily by people in touch with decision-making in the particular organisation concerned. ESRI tries to help this development function at the start of a project by consulting potential users and interested research workers. Before publication, too, the views of interested bodies are sought.

Dr. de Meulder said the question was not intended to put ESRI on trial, but to broaden the definition of STI and to bring to the attention of the meeting the need for a systematic approach in organising information dissemination from the various social science fields. The Chairman also remarked that the problem in Ireland might not be as urgent as the question would imply and that in any case it was difficult to make progress in this field.

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Dr. de Meulder said that the Examiners had agreed that Government administration should be an important user and provider of information. It is noted in the Review (14) that the provision of in-house information services in Government is not very high and that there is no evidence that information of a non-confidential

nature, collected by Departments for specific purposes, is at the disposition of other Departments and of the community as a whole. He asked:

"What action should be undertaken to improve communication between Government Departments and between them and the entire Irish community?"

Mr. Murphy agreed with the thesis but was struck by the quotation from ... Review, which might be turned round to say: "Is there any evidence that information of a non-confidential nature collected by Departments for specific purposes is not at the disposition of the Departments and of the community as a whole?" Experience shows that there is no great difficulty in transmitting information between one Department and another.

To emphasize the importance of communication, the Institute of Public Administration started a series of seminars for higher State servants. The first was attended by the Taoiseach, who urged all Departments and State agencies to develop a positive attitude towards the question of communicating with people who are affected by, or who may be interested in what they propose. These seminars have increased the awareness of the need for communicating, but there is still a long way to go. Considerable guidance is expected from the new Board for Science and Technology when it is set up.

Mr. Sheehy speaking for his Department said that Government Departments have an enormous amount of information, much of which is outside the widest interpretation of STI. The public service is alive to the need for the most open possible system within and between Departments, and between Departments and the public. His Department has a very good internal information system; the providers and main users of most of its statistical information are local authorities. The Department relies on AFF to produce and analyse much data necessary for policies and decisions.

It publishes a tremendous amount of information on all the work done by Local Government. Some of this may be 'dated' when published, but the philosophy is to produce information of value, and also, to find out what information a particular body of users wants and to produce it.

Replying to a question from the Chairman on formal arrangements for information exchange between Departments Mr. Murphy felt that interdepartmental committees were valuable. They create an awareness of the information needs of other Departments, and even when these committees cease to exist personal contacts remain and information continues to flow between Departments.

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Mr. Klintøe said that education of users is an important point which is being increasingly stressed. Promoting new information services, explaining their value, training users to make effective use of them, are vital aspects of the provision of information services. He then posed the following question:

"What measures do the Irish authorities envisage to promote use of existing services?"

"What facilities are planned to educate and train users, beginning in schools and universities and continuing with programme for people already working and the general public?"

Mr. O'Floinn said that the Report does not deal adequately with the primordial place of University Libraries within the ambit of national STI services. He agreed with the proposals that all Libraries be brought together into a national network, but wondered how University Libraries would fit in. The Report however, recommends separate financial support for research and for information activities and this will be carefully considered by the Higher Education Authority and the Department of Education.

About ten years would be needed to achieve the necessary improvement of library facilities. Capital provision for building, allocations for increased staffing and acquisitions are budgeted for, but some years must elapse before libraries can be expected to match the needs of Colleges. It will be necessary to incorporate some information training into teacher training courses and to ensure a realistic development of a library information function in all Regional Technical Colleges.

Dr. O'Raifeartaigh also stressed the place of university libraries and of the National Library within the ambit of national STI service. Such a service will depend largely on these libraries, which cannot be established in a highly sophisticated way for five to ten years. The Royal Irish Academy Library is also important because it is used by public bodies to establish contact with scientific institutions in other countries.

On the recommendation for separate financial support for research and information activities within the funding mechanism for higher education, he said that the HEA does not like the idea of ear-marked funds. This procedure is not applied to recurrent funds to universities. It is left to the universities to decide the share of their budgets to be allocated to libraries.

Dr. J. Reidy described the creation in the Faculty of Agriculture, UCD, of the Kellog Agricultural Extension Centre and its responsibilities for post-graduate and in-service training programmes. The Report had placed great emphasis on the generation and dissemination of STI to potential consumers, while the problem of the efficient application of knowledge and information to solving industrial and agricultural problems had been under-rated. The aim of training programmes at the Centre is to improve the professional competence of members of the Agricultural Advisory service. Many assumptions and principles which underlie such a training programme would be equally relevant to the training of professionals doing similar work in other fields and he suggested that the Centre's resources and experience might be of use to people in industry.

Fourth Topic

THE SUBSTANCE OF A NATIONAL STI POLICY

The first questions were introduced by Dr. de Meulder who quoted from the Report: "The whole purpose of a national information policy is to allow government to decide, in relation to national needs and resources, what information activities should be considered, developed, and/or subsidized."

He then posed the questions:

"Do the Irish Authorities agree with this statement?"

The Examiners believe that there is an imbalance of resource allocation between agriculture and other sectors and that more funds should be attributed to information services for industry.

"What principle should guide the allocation of resources to the variety of information services required to serve national needs?"

Responding to the first question Mr. MacLiam accepted that it is the predominant but not necessarily the whole purpose of an STI policy. He would expect that the existence of a clear STI policy would be a very important input into science or education policies. Also it had been hoped that a clearly described and well understood information policy would be accepted as a guide by major bodies not under direct government control.

Mr. Murphy agreed that there is an imbalance in resource allocation and that more funds should be attributed to information services in industry. No clear principle to guide this allocation has yet emerged because the various bodies dealing with science and STI have developed 'ad hoc' to meet emerging needs and there has not been, until recently, any marked attempt to coordinate their activities. A first step in this direction was the setting up of the National Science Council. The next stage will follow the setting up of the proposed National Board for Science and Technology (NBST). Its functions have not been fully defined but the Government would look to the new Board to guide it in formulating principles for this purpose.

Mr. Sheehy would have welcomed a positive statement that more is required for areas other than industry. For instance, last year international experts suggested the AFF dissemination service should be increased. But if more were to be spent on dissemination, research would have to be cut back unless more funds were made available. His conclusion was that, in a national approach, the NBST

will have to study medium and long-term programmes rather than annual budgets of research institutes and other STI bodies. In looking at these programmes, the Board will pick out the weaknesses and gaps and make recommendations accordingly.

Dr. Spain stressed that agriculture is not confined to primary production. A large part of Irish manufacturing industry is made up of firms processing agricultural products and servicing agriculture; on this basis 40 per cent of total Irish employment is directly or indirectly dependent on agriculture. If R and D and STI expenditures are looked at in this light, the imbalance in resource allocation between agriculture and other sectors seems more apparent than real.

He pointed out a misapprehension in the Report about the relation between the size of the Irish Agricultural Advisory Service and that of other countries, particularly Canada. * The Agricultural Advisory Services development in OECD Member countries showed that most European countries had a more developed and intensive advisory service than Ireland. Due to particular conditions Irish farmers have had to be provided with an advisory service to help them with their problems, and this service has developed in response to demand.

Dr. Walsh supported Dr. Spain's statement about the balance in allocating resources. He agreed with the principle enunciated by OECD in Information for Changing Society that STI policy could not be considered separately from policy for science and technology which in turn could not be separated from policy for economic and social goals. He agreed also with the two further guiding principles: i) that information must be appropriately packaged and interpreted for each specific community of users, and ii) that the quality of information, its reliability and credibility, is more important than access to masses of data. The needs of the user can be adequately met only by combining STI with other kinds of information.

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Dr. de Meulder stressed that national information policy should be seen in the context of the objectives of socio-economic development and should be especially closely linked to research policy. He asked:

"Are the planned developments of information services of such a kind as to contribute to a more effective exploitation of Irish resources, and to provide an effective feedback to Government for framing new research policies?"

Mr. MacLiam replied that linkage between information policy and research policy is recognized but STI policy should also have close links with industrial policy. The major object in expanding industrial liaison advisory services is to have the resources in research institutes, universities and other institutions exploited by industry. The arrangements should also ensure a steady feedback in order to determine the directions in which R and D efforts should be pointed. We must avoid at the same time being unduly influenced by feedback results. R and D policy should certainly have regard to present demands but it must also foresee future demands.

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* This factual mistake in paragraph 2.5 of the draft has been corrected in the final version of the Examiners' Report.

Introducing the third set of questions, Mr. Klintóe said that the Examiners believed that basic research in information science is not an Irish priority. Identification of foreign information services and their adaptation to Irish needs may play an important part in developing a national information system.

"What measures are envisaged to establish such an applied research function in Ireland and to coordinate its action?"

"Should such work of adaptation to Irish needs be linked to a continuing analysis of these needs, both in the research and technical environments and in the country at large?"

Professor Dillon said that it is unreasonable to expect success in any operational enterprise without sufficient information processing systems. It is also unrealistic that Ministers and senior civil servants can participate effectively in national decision-making without access to adequate information processing machinery. A basic task is to convince industrial managers that decision-making can be risky unless backed up by reliable information services. Thus, the application of information techniques of varying levels of sophistication to meet national and local needs must be accepted as an important national priority.

The NSC agrees with the Examiners that an appropriate applied research programme should be established with a view to accelerating and coordinating national involvement within this sphere of activity. It also wishes to encourage a national involvement in basic research since an adequate degree of expertise is desirable in appraising foreign information services. This involvement should also facilitate the exchange of ideas and research results with foreign organisations.

The NSC also wishes to see the continuation by IIRS of pilot schemes relating to mechanized systems such as MEDLARS and INSPEC. Experience gained in operating such pilot schemes is valuable although the usefulness of the service provided to clients may be limited at present. Stimulating and coordinating research in the general information field would be the responsibility of the NBST which would be able to use the proposed Special Fund to provide an extra stimulus in suitable areas.

The NSC agrees that there is a need for continuing analysis of national and local requirements regarding the whole STI system. Some form of feedback is also essential. Studies have already been initiated, e.g., the recent IIRS survey leading to the Review of Scientific and Technical Information in Ireland, and the survey of communication patterns by the Agricultural Institute in collaboration with Professor Allen of MIT. In future this type of investigation could most appropriately be funded from the NBST Special Fund.

The NSC considers that there is a continuing need to improve mechanisms for person to person transfer of information, both at national and international level, and that personnel mobility is a most important means of assisting innovation, particularly in industry.

Fifth Topic

INSTITUTIONAL ARRANGEMENTS FOR INFORMATION POLICY

Dr. de Meulder recalled that the mechanism proposed for implementing this national policy is described in Chapter 6 of the Examiners' Report. He asked:

"Do the Irish Authorities agree with the main lines of this proposal?"

"Do they feel that machinery of this kind will give them sufficient feedback from the user community to take decisions on the best use of available resources?"

"Will this machinery encourage dialogue among those responsible for different kinds of information services and with Government?"

Mr. Murphy replied that the first attempt to draft a new set of institutional mechanisms for science and technology was made by the NSC in its report Science Policy Formulation and Resource Allocation. The Government considered this report and took a decision on only one of its recommendations, i .e. to set up, in principle, a Statutory Board for Science and Technology. It reserved decisions on the functions of the proposed Board and on its relationship with other scientific and technical agencies until it had more information, in particular the Examiners' Report and the Proceedings of the two confrontations. This reserve inhibits discussion of the details set out in the Examiners' Report.

The main difference between the NSC and the Examiners' proposals is that the former envisaged the National Board as having resource-allocating powers, whereas the latter recommended that it should have an advisory function in this regard. On this advisory function, the two reports have set out an elaborate scheme of institutions involving as subordinate committees, a Cabinet Committee for Science and Technology and the outline of a Science Budget. While these have many merits, he was in a difficult position to comment on them. He felt that the mechanism proposed by the Examiners would be a great improvement on the present position, where a fairly large number of almost autonomous bodies, set up at different times to meet different needs, have developed along their own lines and within the limits of the organisational set-up.

Decisions ultimately taken will certainly incorporate many features of the scheme proposed by the Examiners. He could see no great objection to any of them

but they have to be taken as a whole, and raise important questions involving the Government. They seem adequate for the purposes mentioned in the last two questions, but it would be better to await the views of the proposed National Board. If a scheme like that proposed by the Examiners were introduced it would be prudent to review it in the light of experience of its operations, say after two to three years.

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Concerning the Committee of the Cabinet on Science and Technology, Dr. de Meulder said that it is intented to make possible interdepartmental discussions at a high policy level. He went on to ask:

"Do the Irish Authorities believe that this will enable an information policy to be oriented in relation to the development of national policies in other fields?"

"Do the Irish Authorities agree, in relation to the sharing of resources, that those organisations which have information as only one of their functions should receive a separate vote for information, so that national budgeting for information can be more effectively controlled?"

Mr. Murphy replied that the concept of a Cabinet Committee for Science and Technology was embodied in the Report of the NSC; the Government has considered it but has not taken a decision on it. There are difficulties in setting up such a committee which would be a completely new departure in governmental machinery. We have no experience of permanent cabinet committees, and ad hoc Cabinet committes have only been set up for short-term and special tasks. There is no legislative or constitutional provision for such a committee, and the decision on it must be left to the Government. He did not think a cabinet committee essential to many of the recommendations in the Report. It certainly gives a broader input into Government, but a Minister with responsibility for science and technology can adequately channel to the Government the recommendations and advice emanating from other institutions, as proposed in the Examiners' Report. Under the present system the Minister for Finance is concerned with economic and social planning, including scientific planning. If this overall responsibility for science and technology were given to a Minister specially and exclusively designated for that purpose it would be a substantial improvement on the present system.

There is no fully effective system for coordinating science policy or budgetary allocations. The latter tend to be considered mainly by reference to the individual institutes and in the light of the estimate for their parent Department. This does not allow the Government or the Minister for Finance to consider policy and budgetary allocation for science and technology in a horizontal way. If a new body were charged with drawing up a Science Budget going right across the various institutes, the Government would be better informed to take decisions on the total allocation for science and technology as compared with the competing demands from other areas. It would also be able to distribute these resources with greater wisdom and precision within the various scientific activities.

He saw great merit in the Examiners' proposals. The Cabinet Committee might be a better arrangement but as long as there is a communication channel

from a central scientific body to a Minister most of the substance of the Examiners' recommendations would be met.

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On the role of the NBST as set out in Chapter 6 of the Report, Dr. de Meulder asked:

"Do the Irish Authorities agree on this role; particularly with regard to its planning, budgeting and management?"

"Do they also agree with the proposals for relationships between the NBST and the Library Coordinating Committee and the Coordinating Committee for Information Services, as special working groups of this board?"

Professor O'hEocha noted the broad agreement between the proposals of the Science Policy Examiners and STI Policy Examiners in relation to a public institutional mechanism for science and technology. They have, in fact, much in common with the NSC's own recommendations. The NSC was concerned that the new administrative machinery could ensure, among other things:

a) that technical programmes, developed within the vertical Government departmental structure will be capable of dealing with horizontal problems, cutting across traditional departmental responsibilities; and

b) that short-term financing of scientific programmes will be consistent with long-term policy for the attainment of agreed national goals.

The functions proposed for the NBST and mechanisms suggested for their execution will enable it to achieve most of the objectives which the NSC proposals were designed to attain. Given good will, the NSC believes the machinery suggested by the Examiners will work. It welcomes the concept of a science budget as a means of assessing policy and recognizing duplication or gaps in the national scientific effort. The NSC supports the inclusion of an STI sub-budget as part of the science budget. By this means STI services could be effectively co-ordinated. It also favours the establishment of focal centres (centres of excellence) for R and D activities. Presumably the location of a national STI centre or appropriate STI facilities related to these would follow.

The NSC welcomes the recommendation that the NBST be provided with a special fund to enable it, interalia, to encourage exploratory activities in information services such as studies, pilot projects, etc., which are particularly important at this stage of Ireland's involvement in STI. The special fund could also be used to encourage interaction between operational organisations concerned with STI.

The functions proposed for the two committees recommended by the Examiners seem eminently sensible. He felt some common membership would be necessary. The proposed Library Coordinating Committee might more appropriately be named the Documentation Coordination Committee. The NSC welcomed the suggestion that this Committee would interact with both the HEA and the NBST.

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Dr. de Meulder stated the Examiners'belief that the NBST should be the "national focus for information" in Ireland, and asked the following questions:

"Are the Irish Authorities in agreement with this principle?"

"Do they think that the close relationships between science and information implied in this arrangement is the best that can be envisaged for Ireland?"

Professor O'hEocha agreed that it is desirable to have a national focus for information policy, and noted the importance attached to this concept in the OECD publications Information for a Changing Society and Government Responsibilities on Information for Industry. If the NBST were to appoint expert committees for documentation and information services, it could act as such a focus and provide a link between science and information policies.

Whether this arrangement is the best that can be envisaged must await further consideration. The definition of STI used by the Examiners encompasses non-technical, marketing, economic and other information, and introduces activities which would not normally fall within the jurisdiction of NBST. However, if links proposed with organisations such as IDA, IMI, CII and marketing bodies functioned efficiently, NBST could undoubtedly be an effective national information focus.

Dr. Long welcomed the Examiners' proposal regarding institutional structure which appeared to alleviate problems the NSC proposals might have created, but recommended careful examination and consultation before the proposals were implemented. He agreed with the proposal to form two committees and accepted the logical inference that the NBST would be the national STI focus. However, if the proposed mechanism were to be effective the national focus should be able to commission and publish studies on special aspects of STI. It should also have resources to support on a trial basis operational services aimed at filling an existing gap, or improving the level of technology, in operating STI services. The NBST must have an earmarked STI budget and must not compete with existing services for funds.

Since NBST would have major responsibility of advising on priorities and the allocation of resources to STI, it would have to make assessments and take decisions on the recommendations of its two committees. Consequently, NBST and its Secretariat must contain within itself high level STI expertise.

The proposal for a separate STI budget could be valuable. The relative national importance of STI will be directly related to the interest the NBST has in it. It would be regrettable if STI were regarded as an area of low priority, or as a competitor for funds. It would be advantageous if a mechanism of direct discussion with the NBST could be accorded to the two major STI services (i. e. agricultural and industrial).

He assumed that the proposed earmarking of grants to operational organisations would be for new services or for expansion or reorientation of existing services. Funding of existing operations would be best dealt with as components of an STI budget which would be part of a national science and technology budget.

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Referring to the functions proposed by the Examiners for the Library Co-ordinating Committee, Dr. de Meulder asked:

"Do the Irish Authorities believe that the Committee could fulfil all functions necessary to establish and manage the library network which is proposed?"

"Are there other problems which the Examiners may have overlooked which would fall within the purview of this Committee, and which the Irish Authorities would wish to see undertaken by the Committee?"

Mr. Sheehy spoke for his Department which has responsibility for public libraries and is the Department to which the Library Council reports. The library service deals with much more than STI. It has its own professional basis and might resent a suggestion that a Library Coordinating Committee, however large or scientific, will deal with, for example, librarian training and career structure and extend across the library service.

It is desirable to bring technical library services up to the best standard. The way to do this is to determine the reasonable requirements of users and the deficiencies of the system, to define what is necessary to remedy the deficiencies and to determine the programme of action. If it is necessary to look at the technical library services as part of total library services it seems reasonable that the NSC should do this either directly, or operating through an agency.

He would not like to commit himself to the idea of the Library Coordinating Committee and felt that it would be up to the NBST to look at the proposal, taking into account any studies then in progress. The Library Council should be involved in any examination. If the NBST approves of the idea of a Library Coordinating Committee it should be careful about its terms of reference which should not go beyond STI.

Miss Power felt that if the Library Coordinating Committee excluded the chief librarians of the main institutions it would not make for success. The Committee should ensure that the allocation of duties between the various libraries should be made, or at least suggested. Training of librarians and users should be undertaken by the librarians in council. More scholarships are needed to encourage people either at post-graduate level or on secondment, to enter librarianship.

Mr. Armitage remarked that the Library Council had not had time to consider the Examiners' proposals about the Library Coordinating Committee. The Council operates the only statutory mechanism in the library field and is seeking to improve this mechanism. The proposals duplicate in many ways what the Library Council is considering, and the Council should have the opportunity of considering them and coming back to the NBST to see whether they co-operate, or else agree which organisation should handle the scientific aspects of the proposals.

Mr. Brown supported the suggestion that 'Documentation' should replace 'Library' in the title of this Committee to which the Examiners assign two types of function. The first concerns planning the organisation of the library network and its infrastructures in order to establish standards, to determine an acquisition policy, to make recommendations on librarian training and career structure, and to submit plans for financing network operations. During this stage, problems may arise with some Government Departments and other agencies responsible for libraries (including privately owned libraries). If these were solved, the Library Committee could certainly perform these planning functions effectively.

The second task is more managerial or operational: to prepare union lists, to organise liaisons abroad and establish a National Referral Centre and a National Repository. A part-time committee could not directly carry out these tasks and it should be more suitable for the Committee to plan how these operations ought to be established or commissioned within the framework of the library network.

There are fundamental problems in envisaging the development of library operations solely in the STI context. The whole library service would benefit from the developments envisaged but some of these would raise considerable problems if they related solely to STI literature under the development plans of the NBST. Therefore, the coordination studies being undertaken by the Library Council should be considered since they relate to the whole field of library activities.

Dr. Henchy said that the Minister for Education had appointed the Chairman of the Standing Conference of National University Libraries to survey the functions of the National Library. The survey has been completed but, unfortunately, it had not been made public yet. Much in it refers to the field under discussion.

While we are waiting for the embryonic library network to develop, existing institutions should be built up so that they would be in a strong position to engage in the network when the time comes. Goodwill and cooperation exist among the large libraries (The Union List is an example). This goodwill continues. Other methods will develop under the Irish Association for Documentation and Information Services.

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The last set of questions referred to the functions given to the Coordinating Committee for Information Services. Dr. de Meuler asked:

"Do the Irish Authorities believe that they are appropriate to national requirements?"

"Do they think that the proposed Committee will provide a sufficient coordinating mechanism for the information services or must further steps be considered towards effective policy formulation, programming and management?"

Mr. Sweeney said that the Coordinating Committee for Informat on Services is intended to promote effective short and medium-term cooperation, to meet national requirements. Its effectiveness will largely depend on the level of representation of various organisations. It should be a high level Committee, of which notice will be taken. The representation should indicate that the participating organisations are committing themselves to STI cooperation and coordination.

No real problems of duplication or overlap have arisen between organisations. The problems are rather of achieving sufficient specialization within the various services, of deepening operations and thus creating cooperatively an interdependence between organisations.

An important point concerning the two Committees is the complex question of feedback from the user community. The functions of the Committees will evolve

around their ability to bring this feedback to the notice of the NBST. The sole means of communication between the Committees and the NBST will be the Secretariat which must, therefore, be able to appreciate the feedback, the demand for STI and the level of provision of STI services. If this is the case, the proposed structure should work extremely well.

Of the remarks put forward by delegates the following is a summary:

Mr. Van Dijk (Netherlands) cautioned the meeting not to mix operations and policy in the same committee. Dr. Silva de Sousa (Portugal) stressed the importance of contact and dialogue with the users. Dr. Cockx (Belgium) would like industry, through appropriate mechanisms, to be more involved in shaping and formulating the STI policy.

Mr. Gray (UK) said that it might be worth considering the coordination of library automation as a further task of the Library Coordination Committee. Also since the NBST would be advised by two committees representing different but related functions which might compete when they should cooperate, the machinery should include some way of bringing these committees together, for example: joint meetings, a common bureau and a strong Secretariat.

Mr. Mauperon (EEC) warned against the risk of destroying some achievement in trying to redistribute scarce resources more fairly. As Ireland is a member of EEC, he called attention to new factors which have some bearing on resources, policy and structures which ought to be taken into consideration. He reminded the meeting that the role of the Commission, apart from helping the coordination of efforts and policies of Member states, is to propose actions where and when they are most likely to achieve results.

ACKNOWLEDGEMENTS

The Chairman, Mr. Winters, congratulated the Examiners and the Secretariat on all that they had achieved. He again thanked the Irish Delegation and particularly its leader, Mr. Murphy, for the warm welcome they had given all their visitors. He had been struck by the openness of their replies, especially as many of the questions were difficult to answer at a time when the Government was changing and policies were evolving rapidly. On behalf of the IPG representatives he thanked the Irish Authorities for giving them a better insight into problems which all of them faced, so helping to clarify the role of an information policy in relation to Government responsibilities.

Mr. Murphy thanked OECD and the IPG members for agreeing to meet in Dublin. During the meeting he had tried to ensure that each member of the Irish Delegation had the opportunity to express his personal opinion. Inevitably this showed up certain divergences of viewpoint; however, all were unanimous in praising the Examiners' Report, the value of which would become clear in the coming months when there had been opportunity to study in greater detail the proposals made by the Examiners while developing their new structures for a national scientific and technical information policy.

ANNEXES

ANNEX I

LIST OF ABBREVIATIONS

AFF	An Foras Forbartha - The National Institute for Physical Planning and Construction Research
AFT	An Foras Talúntais - The Agricultural Institute
AnCO	An Chomhairle Oiliuna - The Industrial Training Authority
CAO	County Agricultural Officer
CONUL	Council of National and University Librarians
CTT	Córas Tráchtála Teo - A state-sponsored body primarily concerned with export promotion
EEC	European Economic Community
ESRI	Economic and Social Research Institute
FTE	Full Time Equivalent
IADIS	Irish Association for Documentation and Information Services
ICLS	Irish Central Library for Students
IDA	Industrial Development Authority
IMI	Irish Management Institute
MARC	Machine Readable Catalogue
NLL	National Lending Library
NSC	National Science Council
SFADCO	Shannon Free Airport Development Company, Ltd.
SDI	Selective Dissemination of Information
STI	Scientific and Technical Information
TCD	Trinity College, Dublin (University of Dublin)
UCC	University College, Cork (Constituent College of National University of Ireland)
UCD	University College, Dublin (Constituent College of National University of Ireland)
UCG	University College, Galway (Constituent College of National University of Ireland)

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ANNEX II

BIBLIOGRAPHY

(1) OECD, Information for a Changing Society; Some Policy Considerations, Paris, 1971, p. 21.

(2) Science and Irish Economic Development, Report of the Research and Technology Survey Team appointed by the Minister for Industry and Commerce (in association with OECD), Dublin, The Stationery Office, 1966.

(3) National Science Council, Scientific and Technical Information in Ireland: A Review, Dublin, The Stationery Office, 1972.

(4) Review of 1971 and Outlook for 1972, Dublin, The Stationery Office, 1971.

(5) Reference (3), par. 5.1.2.1, p. 48.

(6) Ibid., par. 5.1.3.1, p. 50, see also Table 5.3, p. 51.

(7) Ibid., Table 2.8, p. 25.

(8) Ibid., Table 5.5, p. 58.

(9) Ibid., par. 5.1.9, p. 55.

(10) Ibid., par. 5.1.7.7, p. 54.

(11) Reviews of National Science Policy - IRELAND, p. 48, second par., OECD, Paris, 1974 (ISBN 92.64.11176.X).

(12) Reference (3), par. 6.5.1, p. 65.

(13) Ibid., Table 2.6, p. 25.

(14) Ibid., Par. 6.5.1, p. 65.

(15) National Science Council, Research and Development in Ireland 1969, by Diarmuid Murphy and Donal O Brolchain, Dublin, The Stationery Office, 1971.

(16) National Science Council, IRELAND - Background Report on Science and Technology, Stationery Office, 1972.

(17) Institute for Industrial Research and Standards, A Survey of Scientific and Technical Information in Ireland, Vol. 1: Report; Vol. 2: Appendices, 1973 (ISBN 0 900450 34 7).

(18) Central Statistics Office, Statistical Abstract of Ireland: 1969, Dublin, The Stationery Office, 1971.

(19) Technical Information Division of the Institute for Industrial Research and Standards, Sources of Scientific and Technical Information in Ireland, *Dublin, 1972.*

(20) National Science Council (Science Policy Research Centre, Department of Political Economy, University College Dublin), Studies in Irish Science Policy, Dublin, The Stationery Office, 1973.

(21) OECD, Review of National Scientific and Technical Information Policy: Canada, Paris, 1972.

ANNEX III

COMMENTS ON THE EXAMINERS' REPORT

Comments have been received from many organisations and individuals dealing mainly with specific points in the Report. Wherever possible these points have been taken into account in preparing the final draft.

The following comments on the form and content of Chapter 1 ('The Irish Context') have been received from the Economic Planning Division, Department of Finance:

> In the opinion of (this) Division the first chapter concentrates unduly on negative features of the Irish economic situation. It is important to indicate that the country is in the course of rapid transition from an agricultural to an industrial economy, and to refer to the progress made in the 1960's and to the main features of the policy followed. It is also important to state that nevertheless full employment has yet to be achieved, and to give figures relating to unemployment, emigration and underemployment. The lower living standards vis-à-vis other EEC member stated is also in important consideration.
>
> From these points the chapter might infer the following main objectives:
>
> 1. to attain full employment as rapidly as possible, and
> 2. to close the gap in relative living standards.
>
> The principal means to achieve these objectives might also be indicated. Ample material on which to base such a recast chapter is available in OECD surveys of the Irish economy and in background reports submitted to OECD for the annual surveys and for the reviews of Irish science and manpower policies.

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